

Rock Products and BUILDING MATERIALS

INCORPORATING DEALERS BUILDING MATERIAL RECORD

Volume XVIII.

CHICAGO, ILL., JULY 22, 1916.

Number 6

Do You Sell the Material for 80%
of the New Buildings?

It has been proven that 80% of all buildings erected are residences. Every one of these built in your locality is a logical prospect for metal lath.

It makes no difference whether it is a stone, brick, frame or stucco house. There are such tremendous advantages in using metal lath for all plastering work that all you need to do is to point them out to the homebuilder.

Let Us Help You  Cinch These Sales

by informing those who are building homes in your locality of the value of metal lath construction. We will send the data to you or mail it direct to a list sent by you.

We have an expanded metal lath suitable for every class of interior or exterior plastering work. These are described in our big Kno-Burn catalog. Write for a free copy.

North Western Expanded Metal Co.

929 Old Colony Building
CHICAGO, ILL.

MANUFACTURERS OF
KNO-BURN, EUREKA,
XX CENTURY, PURE
IRON, KNO-FUR, DIA-
MOND MESH AND
CHANELATH

Giant BELT for Your Drives
Granite BELT for Your Elevators
Supremo BELT for Your Conveyors

WHY? ASK US.

Revere Rubber Co.

BOSTON NEW YORK CHICAGO NEW ORLEANS PHILADELPHIA

Clinchfield Portland Cement Corporation

General Office and Mills:

Kingsport, Tenn.

*Strong
&
Sound*



*Fine
&
Uniform*

"The Acknowledged New Standard of the South"

**Annual Capacity
1,500,000 Barrels**

*Sales Offices:
KINGSPORT, TENN.*

1905 Union Trust Bldg. 908 Com'l Bank Bldg. 413-15 Am. B'k & Tr. Bldg.
CINCINNATI, OHIO CHARLOTTE, N. C. SAVANNAH, GA.



"PENNSYLVANIA"

Hammer Crushers For Crushing and Pulverizing Lime
Limestone, Gypsum, Marl, Shale, Etc.
Main Frame of Steel, "Ball and Socket" Self aligning Bearings;
forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand
wheel while Crusher is running.
No other hammer Crusher has such a big Safety Factor.

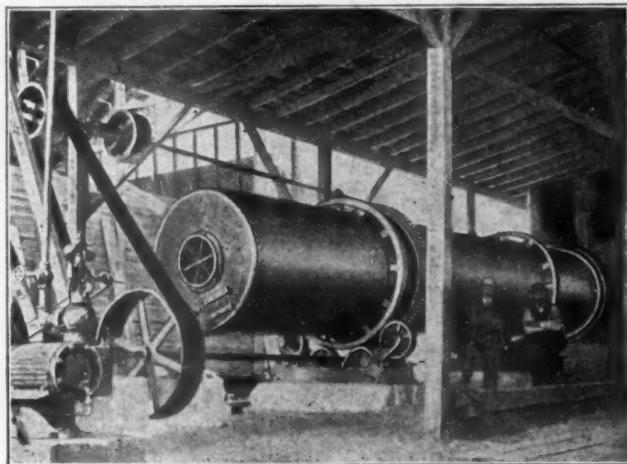
Pennsylvania Crusher Co.
New York PHILADELPHIA Pittsburgh

CONSISTENT ADVERTISING
UNLIKE THE PROVERBIAL ROLLING STONE
GATHERS MOSS

RUGGLES-COLES DRYERS

STATIONARY AND PORTABLE

"Built to Dry at the Lowest Ultimate Cost"



Seven different types of dryers in many sizes and special dryers designed and built to meet unusual conditions. We are now drying 67 kinds of materials, among them sand, rock, gravel, gypsum, coal, clay, etc.

Our many years of experience is at your service

Ruggles-Coles Engineering Co.

Eastern Office:
50 Church St.
New York City

Western Office:
222 S. Michigan Ave.
Chicago, Ill.

Daily Capacity
9000 Barrels



MORE THAN FIFTEEN YEARS OF SATISFACTION

FOUR PLANTS:

ALPENA, DETROIT, WYANDOTTE and CLEVELAND

HURON and WYANDOTTE

Great Water and Rail Facilities
Best Serve the Entire Middle West

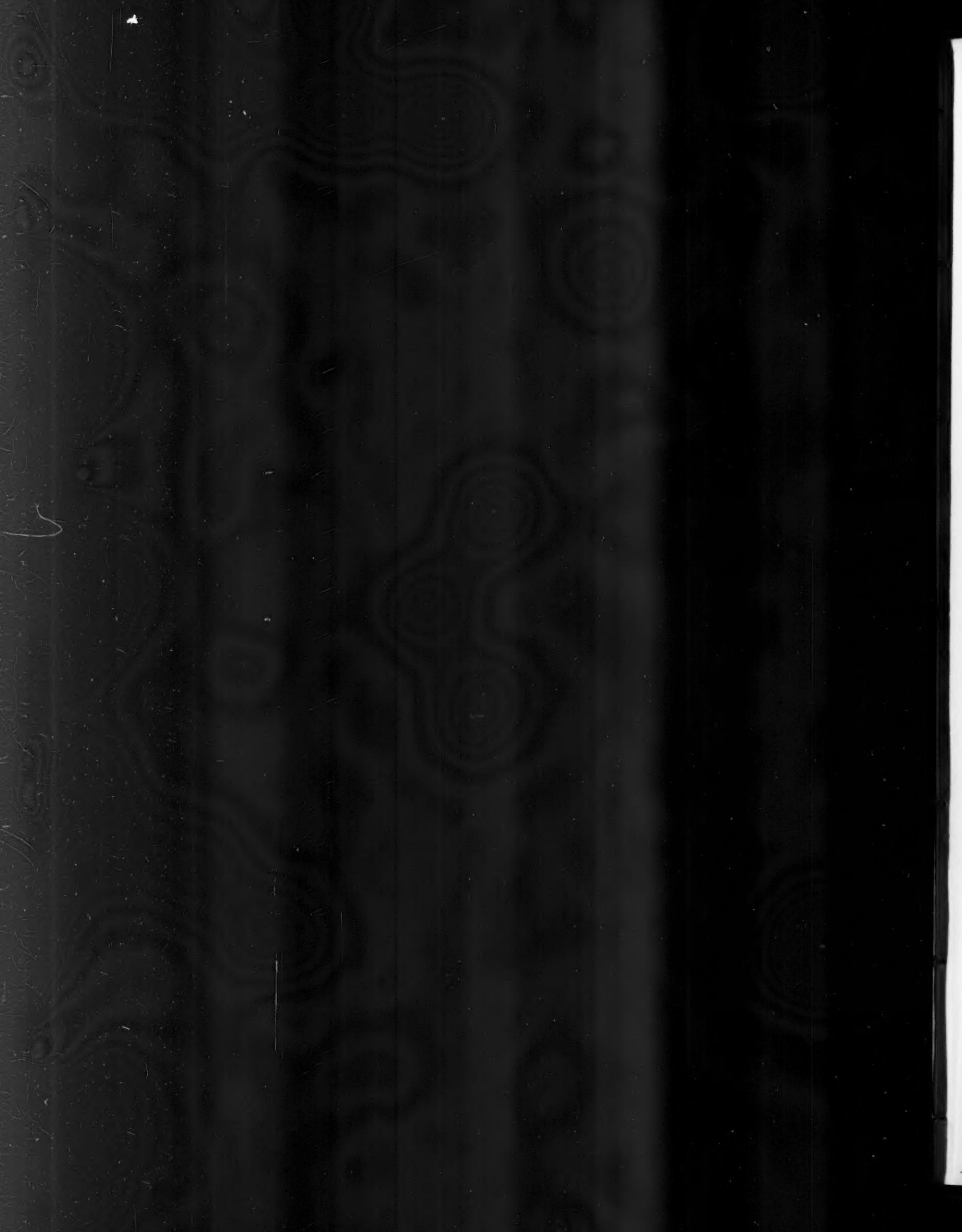
EVERY BARREL TESTED AND GUARANTEED
SOLD BY THE BEST DEALERS USED BY THE BEST BUILDERS

Main Offices: 1525 Ford Building, Detroit, Mich.

Daily Capacity
9000 Barrels



Quality
Quantity
Service



How Many Men Do You Employ?

The economy of labor, with the use of the Lakewood Clam Shell Bucket in handling material, whether in the stone quarry, sand pit or yard, is an important factor in the labor situation, either at this particular time or in the future.

Less Men and Less Wages

with large capacity and smaller overhead, are additional features that make the Lakewood Bucket an essential part of your equipment.

"After installing your bucket, we had no trouble in keeping our yard going and only needed to operate your bucket about two-thirds of the time to do so," is a typical example of letters from Lakewood Bucket owners.

The Lakewood Clam Shell Bucket is essentially a "digger"—a powerful and efficient bucket, that will work well and pay well under all conditions of service. It has been repeatedly proven that the Lakewood Bucket has far greater working capacity than any other type of bucket regardless of type.

Why not have the Lakewood Engineers discuss Economy with you?



*Built to Last
The Lakewood Line*

**The Lakewood
Engineering Co.**
Cleveland, Ohio



MAXECON

Means MAXimum of ECONomy

Years of experience with the assistance of our hundreds of customers has found THE SOLUTION OF GRINDING HARD MATERIALS. The MAXECON PULVERIZER combines highest EFFICIENCY, greatest DURABILITY and assured RELIABILITY. Uses the LEAST HORSE POWER per capacity. Embodies the features of our Kent Mill with improvements that make it MAXECON.

**WE DO NOT CLAIM ALL of the CREDIT
for this achievement**

We have enjoyed the valuable suggestions of the engineers of the Universal Portland Cement Co. (U. S. Steel Corp.), Sandusky P. C. Co., Chicago Portland C. Co., Marquette Cement Mfg. Co. Western P. C. Co., Cowham Engineering Co., Ironton P. C. Co., Alpena P. C. Co., Castalia P. C. Co., Pennsylvania P. C. Co., and many other patrons.

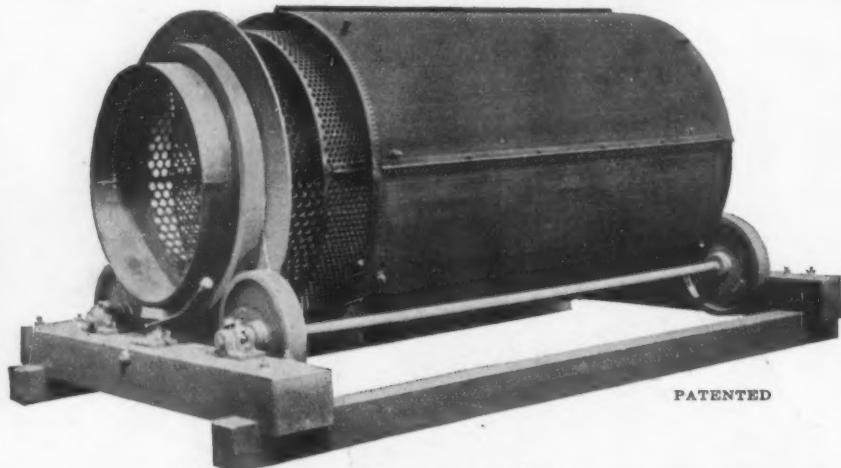
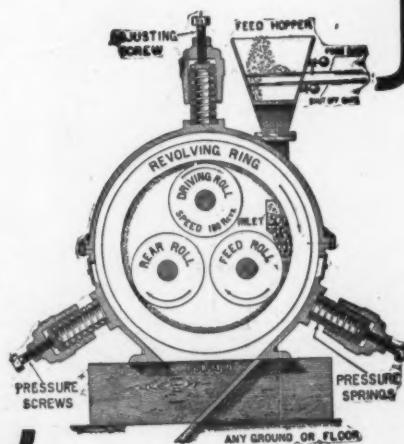
THE RING WOBBLES

The FREE WOBBLING POUNDING RING instantly and Automatically ADAPTS its position to the variations of work.

Its GRINDING ACTION is DIFFERENT than any other; besides the STRAIGHT rolling action of the rolls, the SIDE to SIDE motion of the ring makes the material subject to TWO crushing forces and DOUBLE OUTPUT results.

KENT MILL CO.

10 RAPELYEA ST., BOROUGH OF BROOKLYN, N. Y. CITY
LONDON, W. C., 31 HIGH HOLBORN
BERLIN-HOHENSCHOENHAUSER



Johnston & Chapman Co.
2921 Carroll Avenue, CHICAGO

For Dry Screening Gravel
we make the most up-to-date machine on the market. Simple and Inexpensive.

A New Jacketed Type of Cone Screen for Washing Gravel. A Perfect Screen.

Complete Gravel Washers of Any Size. Successfully used in several of the largest gravel plants in the United States.

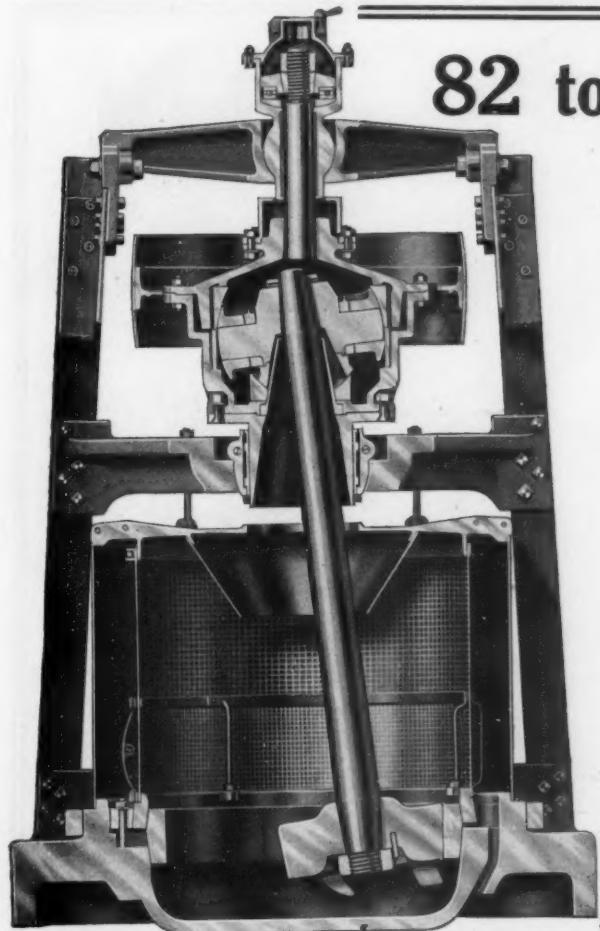
Another of Our Products that Can't be Beat

The O'Laughlin Screen
for Crushed Stone
See Illustration

SCREEN SECTIONS for ALL SIZES of REVOLVING SCREENS

CONICAL SCREEN SHELLS
FOR GRAVEL WASHING PLANTS

Everything in Screens Made Right, for
Crushed Stone, Gravel, Sand, Clay, Ore, Etc.



82 to 83% Through 200 Mesh

Is Easily and Economically Produced
by the

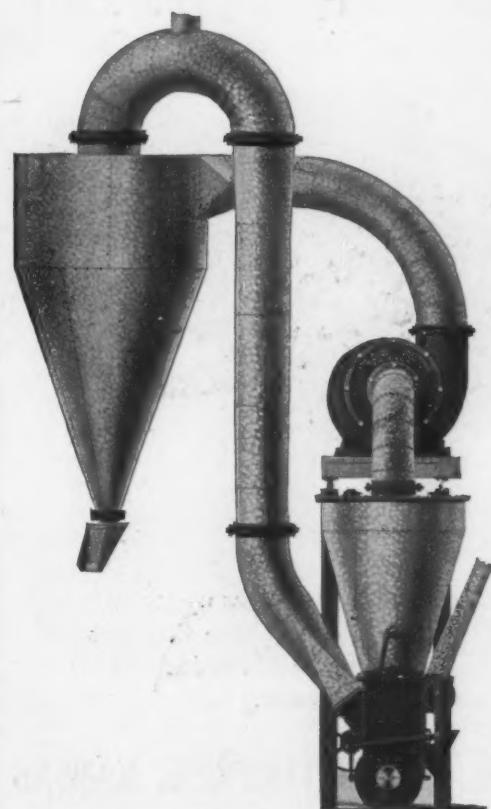
GIANT GRIFFIN MILL

With Latest Improvements

The Griffin Mill has always produced the fineness required and can now meet the new specifications, grinding clinker to a fineness of 82-83% through the 200 mesh sieve at lower cost than any other type of pulverizer or combination of pulverizers

Send for blue prints, descriptive matter, etc., showing our latest model Giant Griffin Mill. It is built to meet the new specifications.

BRADLEY PULVERIZER COMPANY
BOSTON, MASS. WORKS—ALLENTOWN, PA.



The Simplicity of a Pulverizing Machine Which Gives You the Results You Require

To grind any material to an impalpable powder it is first necessary to have a mill which will produce the required fineness economically, second an economical means of producing a uniform product which contains no lumps or oversizes and third to have this finished product delivered to a convenient storage bin or conveyor.

RAYMOND PULVERIZING AIR-SEPARATING SYSTEM

combines all these three requisites in the most economical way.

First, the Raymond Roller Mills and Automatic Pulverizers (which type is used depends upon the character of the material) grind the material economically.

Second, by means of air and our patented Separators we produce any degree of fineness desired and third, this same air, without additional power, is used as a means to convey the powdered material to a convenient storage bin or conveyor.

If you have any grinding problem read our next three advertisements and learn what the Raymond System is and what it can do. Or better still, fill out the coupon today and obtain our book on grinding machinery.

The coupon
will bring
you our
catalog

RAYMOND BROS. IMPACT PULVERIZER COMPANY

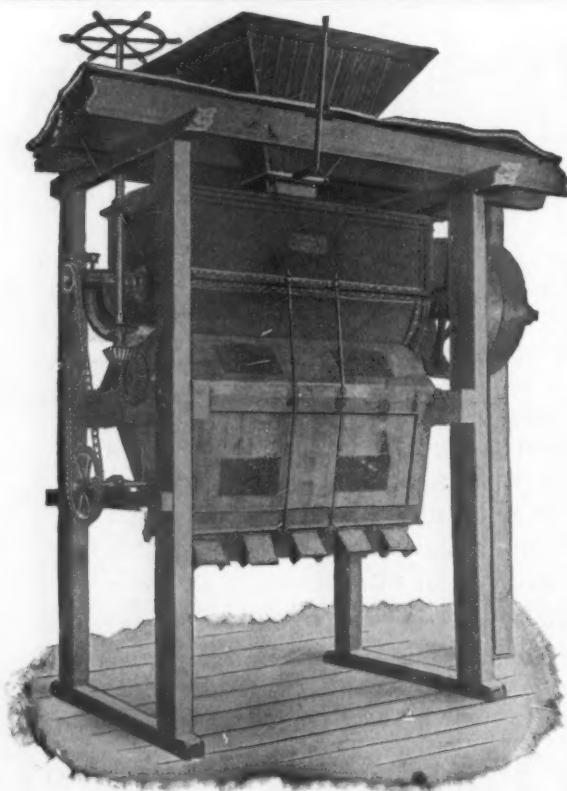
1301 North Branch Street, CHICAGO, ILL.

Please send us your literature.

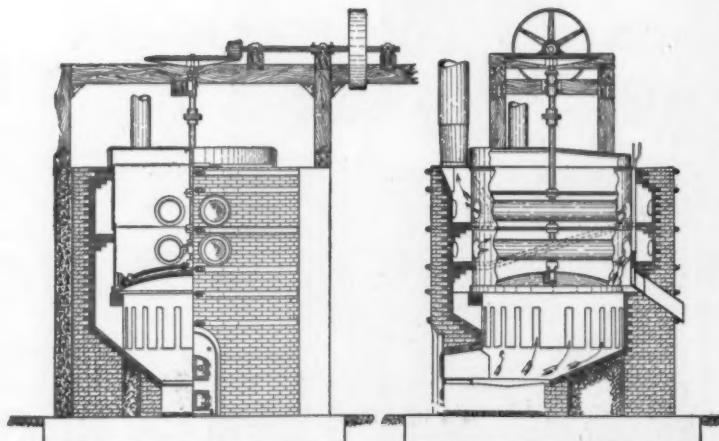
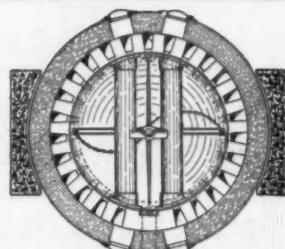
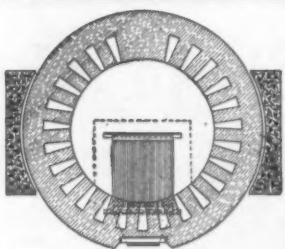
NAME

STREET

CITY, STATE



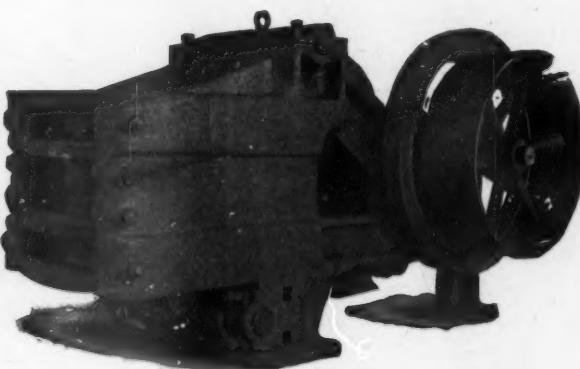
Enterprise Noiseless Mixer



Ehrsam Calcining Kettles—Built in 5 sizes—6-8-10-12-14 feet in diameter, having capacity of from 3 tons to 20 tons to the charge



Horizontal and Vertical Heavy Duty Grinding Mills

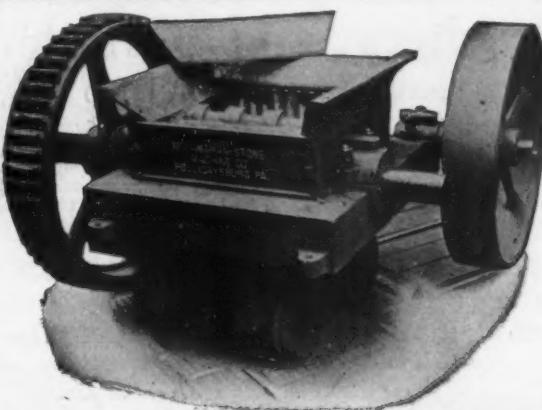


Jaw Crushers Built in all sizes up to 24" x 34" jaw opening. Rotary Fine Crushers in sizes up to 42" inside diameter.

The J. B. Ehrsam & Sons Mfg. Co., ENTERPRISE, KANSAS

Manufacturers of Plaster Mill Machinery, Conveying, Elevating and Power Transmission Appliances

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



OUR SINGLE ROLL CRUSHER IS AS SIMPLE AS CAN BE

Is easily fed, makes less fines than either a Gyratory or Jaw. Capacity 8 to 500 tons per hour. For crushing Limestone, Dolomite, Hard Rock Phosphate, Cinders, Etc. Screens of all descriptions. Washers for dirty stone.

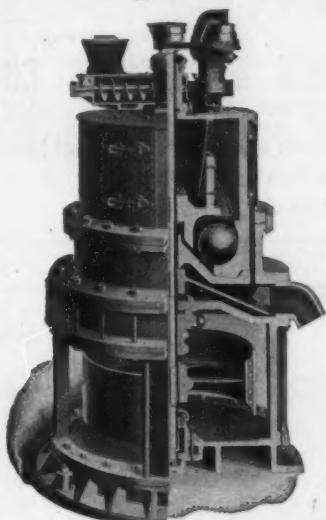
Ask for Information

McLANAHAN-STONE MACHINE CO., Hollidaysburg, Pa.

**BACON & FARREL
ORE & ROCK
CRUSHING - WORLD KNOWN
ROLLS-CRUSHERS**
EARL C. BACON, ENGINEER
HAYMEYER BUILDING, NEW YORK

The Fuller-Lehigh Pulverizer Mill A Complete Self-Contained Unit

The most economical mill for producing
Agricultural Limestone



Reduces lump rock to 20, 40, 60, 80, 100, or 200 mesh.
Requires no outside accessory equipment.
Requires no overhead shafts, drives or screens.
All material discharged from mill is finished product.
No inside journals or bearings.
No inside lubrication.
Uniform feeding system.
Constant and free discharge.
Low installation cost.
Low operating cost.
Low lubricating cost.
Dustless operation.

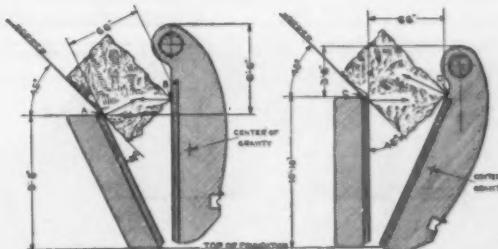
Built in sizes to meet the requirements of your trade. Grinds rock to meet the specifications of all Agricultural Experiment Stations.

SEND FOR CATALOG NO. 70

Lehigh Car, Wheel & Axle Works
Main Office and Works: Catasauqua, Penna.

The Success of A. C. Steel Frame 84"x66" Jaw Crusher Is Due to Its Improved Design Embodying the Vertical Swing Jaw

As Illustrated by a Comparison of Receiving
Openings, Inclined Versus Vertical Swing Jaw



Sketch No. 1:
Allis-Chalmers Vertical Swing Jaw

Sketch No. 2:
Old Inclined Swing Jaw

Improvements in Feeding

Sketch No. 1 shows a block of stone 4'-6"x6'-6", as it would naturally be delivered to the crusher. Note that the stone strikes the moving jaw at a point considerably below the fulcrum point and within the crushing zone. A stone in this position will be crushed, or positively forced into the crusher as the reaction from the surfaces at points A and B intersect each other, thereby preventing any tendency to lift the stone out of the crusher.

Referring to Sketch No. 2, where a block of stone of the same size is shown, note that the stone strikes the moving jaw near the fulcrum point, where there is little motion, entirely outside of the crushing zone, and above the jaw plates. A stone in this position will not be crushed, as the reaction from the surfaces at points C and D do not intersect, and the tendency of these forces is to lift the stone out of the crusher.

In Sketch No. 1 the stone has to turn only 20 degrees to rest flat against the stationary jaw, while in Sketch No. 2 the stone must turn 45 degrees to take the same position.

Note the difference in height of the two types of crusher, measuring from top of foundation to top of stationary jaw plate. Also note that with construction shown in Sketch No. 1 there is much less chance for material to jump over top of the moving jaw.

Improvements in Operating

When taking up wear of jaw plate or inserting new plates, both back and front toggles as well as the shims behind toggles block are readily freed on account of the tendency of the vertical swing jaw (Sketch No. 1) and of the pitman to swing forward because their center of gravity is located behind their respective point of support.

This is an important operating feature considering the great weight of the affected parts.

SMALLER JAW CRUSHERS DOWN TO LABORATORY SIZE

Complete Rock Crushing Plants
and Cement Mills—Power Plants—
Electric Motors—Gates Gyratory Breakers

Allis-Chalmers Manufacturing Company

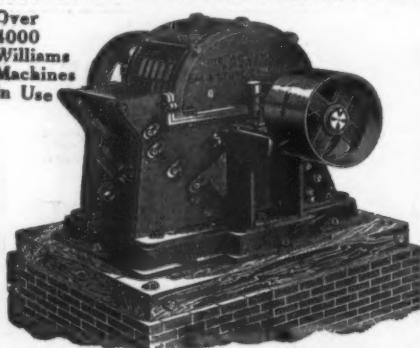
OFFICES IN ALL PRINCIPAL CITIES

MILWAUKEE,

WISCONSIN

For All Canadian Business
Refer to Canadian Allis-Chalmers, Ltd., Toronto, Ont.
FOREIGN REPRESENTATIVES—Chile and Bolivia: Mark R. Lamb, Huercanos 1157, Casilla 2653, Santiago, Chile. Europe, East Indies, etc.: H. L. Keen, 732 Salisbury House, London Wall, London, England. South Africa: Herbert Alsaworth, P. O. Box 6659, Johannesburg, South Africa. Australia: Frank R. Parrot, 833 Hay St., Perth, W. A., and 204 Clarence St., Sydney, N. S. W. South America, China, Philippine Islands, Japan; American Trading Co.

Over
4000
Williams
Machines
in Use



Lump Lime Crushers and Grinders

We specialize in extra heavy crushers for lump lime—for hydrating or for agricultural work

SPECIFICATIONS

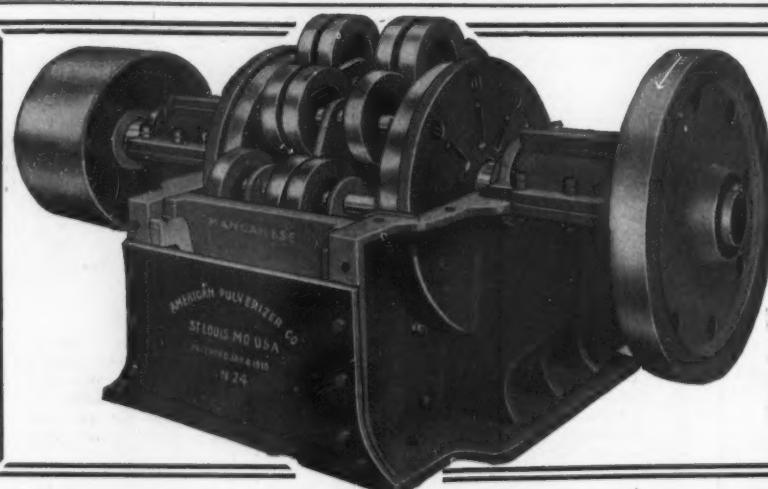
SIZE	WEIGHT	CAPACITY TONS HOUR TO $\frac{1}{4}$ "	CAPACITY TONS HOUR 6 MESH.	H. P.
No. 1	7000 lbs.	8-10	6-8	20-25
No. 2	8500 lbs.	10-15	8-10	30-35
No. 3	12000 lbs.	15-18	12-15	40-50

ALSO MADE IN SIX LARGER SIZES—WE ALSO MAKE A FULL LINE OF LIMESTONE CRUSHERS AND GRINDERS. WRITE FOR BULLETIN No. 4

General Sales Dept., Old Colony Bldg., CHICAGO, ILL.
2705 N. Broadway, ST. LOUIS, MO.
268 Market St., SAN FRANCISCO, CAL.

The Williams Patent Crusher & Pulverizer Co.

A FEW USERS
Kelly Island and Lime Co.
National Lime & Stone Co.
U. S. Gypsum Co.
Tidewater Pt. Cement Co.



The Machine that has POWER TO PRODUCE

and will pulverize limestone, sandstone, gravelstone, brick-bats, gypsum, phosphate rock, slag, glass cullet, manganese ore, coke, electro carbon, furnace linings, stove linings, quartz, etc.—and do the work with less speed, power and upkeep—built the strongest, best designed, best equipped.

Money Back
if machine fails to comply with our Specifications
Particulars and catalog for the asking
GEO. C. VIDETTO, Eastern Sales Manager
207 Fulton Bldg., Pittsburgh, Pa.

AMERICAN PULVERIZER COMPANY
EAST ST. LOUIS, ILLS.

Built to Stand Hard Service— and It Does It



Type A-15 Collapsible Loader handling Crushed Stone at yards of the Sheboygan Railway & Electric Co., Sheboygan, Wis.

The Jeffrey Self-Propelling Loader

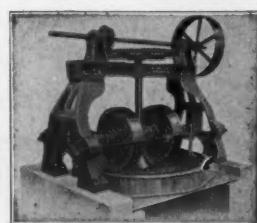
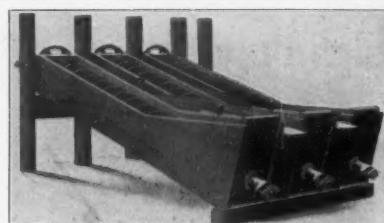
is built Heavy and Substantial to withstand the severe strain of Digging and Loading Crushed Stone, Sand, Gravel, etc., and to resist the wear and tear of Gritty and Abrasive Materials.

Self-Propelling Device enables it to Feed into the storage pile and move from pile to pile under its own power. Only one man required to operate it.

Capacity—1 to $1\frac{1}{2}$ Cubic Yards per Minute. Saves the wages of 2 to 5 Shovelers. Trucks and Drivers are not kept waiting for loads.

Bulletin No. 177-35 has convincing Sales Arguments. Have you a Copy?

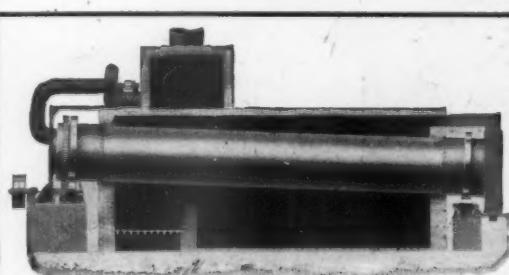
The Jeffrey Mfg. Company 935 N. Fourth St. Columbus, Ohio
New York Philadelphia Chicago St. Louis Milwaukee Boston
Pittsburgh Dallas Birmingham Denver Seattle Montreal



LEWISTOWN FOUNDRY & MACHINE CO.
LEWISTOWN, PA.

Builders of heavy duty crushers and glass sand machinery
Glass sand plants equipped complete

WRITE FOR PRICES AND CATALOG



We make the largest variety of
MECHANICAL DRYERS

Write for Catalog No. 16

We are also Engineers and Manufacturers of
Car Hauls
Crushers and Pulverizers
Drop Forged Chain
Elevators and Conveyors
Soft Mud Brick Machinery
Feeders
Mining Machinery
Mixing Machinery
Sand Plants
Screens

THE C. O. BARTLETT & SNOW CO., Cleveland, Ohio



AUSTIN GYRATORY CRUSHERS

Made in Eight Sizes

50 to 5000 Tons Per Day

Plans and Specifications submitted and expert advice free on any problems involving rock-crushing or earth-handling.

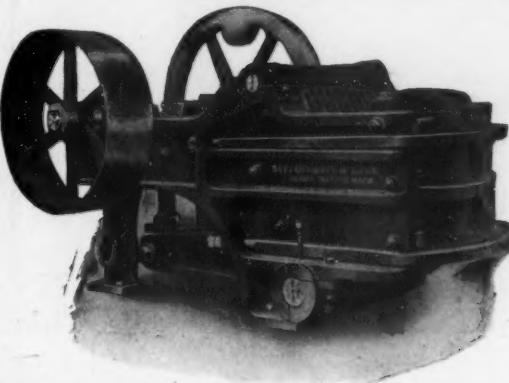
AUSTIN MANUFACTURING CO.

New York Office: 50 CHURCH STREET

CHICAGO

Canadian Agents: MUSSENS, Ltd., Montreal

We manufacture:—Road and Elevating Graders, Scarifiers, Road Rollers, Quarry Cars, Dump Wagons, Stone Spreaders, Street Cleaning Machinery.



Jaw and Rotary CRUSHERS

For all Rocks and Ores softer than Granite

GYPSUM MACHINERY—We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting, etc.

Special Crusher-Grinders for Lime

Butterworth & Lowe
17 Huron Street, Grand Rapids, Mich.



Crackers—6 sizes—many variations.

Record of 48-Inch Crusher for a Period of Approximately 11 Months—

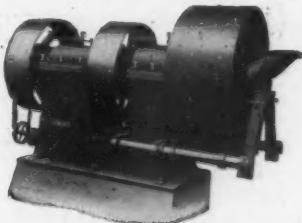
	Per Ton Crushed
Operating labor.....	\$0.00214
Repair labor.....	.00205
Material for repairs.....	.00280
Power.....	.00890
Total.....	\$0.01598
Less extraordinary items.....	.00228
Cost under normal conditions.....	\$0.01370

No. 1 Crusher ran 4,892 hours and crushed 197,640 tons of ore. One pair of discs ran 3,483 hours, crushing 156,385 tons at cost of \$0.0014 per ton for discs.

No. 3 Crusher ran 4,462.5 hours, and crushed 200,812.5 tons ore. One pair disc ran 4,462.5 hours, crushing 200,812.5 tons at cost of \$0.00100 per ton for discs.

Crushers handled 45 tons per hour, crushing 3 in. to $\frac{1}{8}$ in. and requiring 35 horsepower each.

Eventually Symons Discs



MANUFACTURED AND SOLD ONLY BY

CHALMERS & WILLIAMS

New York Office, Equitable Building

1450 Arnold Street, Chicago Heights, Illinois

The Same Work with Less Power

Cut down your running expenses by using less power. Power costs are high—each H.P. probably costs you between \$70 and \$90 a year. Therefore a pulverizer which gives you the same capacity as other crushers but uses from 5 to 10 horsepower less, saves between \$350 and \$900 a year for you in power costs alone.

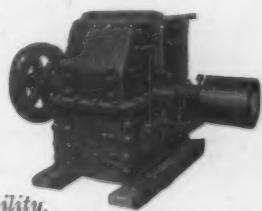
**The All-Steel
K-B Pulverizer**

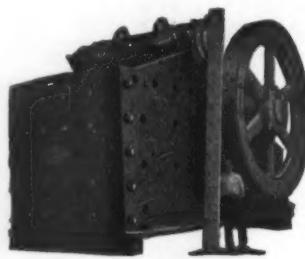
consumes only 10-15 H. P. to reduce 4-7 tons of stone or 8-13 tons of lime per hour from 3" to dust. The No. 2 K-B Pulverizer consumes only 20-25 H. P. to reduce 10-15 tons of stone or 20-25 tons of lime per hour. You can figure for yourself how much the K-B would save you in power costs.

Or better yet, write to us, sending us a small sample of your material, and we can tell you exactly how many tons of your material the K-B will crush per hour, and just how many H. P. will be required.

K-B PULVERIZER CO., Inc.
86 Worth Street New York City

Built for Service and Durability.





"Economy in Operation Puts Dollars in Your Pockets"

Traylor Jaw Crushers with Water Cooled Cast Steel Pitman of greatest tensile strength, Water Cooled Main Bearings, perfect Oiling System, Chrome Steel Toggle Blocks and Manganese Steel Jaw Plates, combined with extra heavy Cast Steel Main Frames. Are **economical**, and made in sizes from 7x10 in. up to 66x86 in. Jaw Opening.

Bulletin J-1.

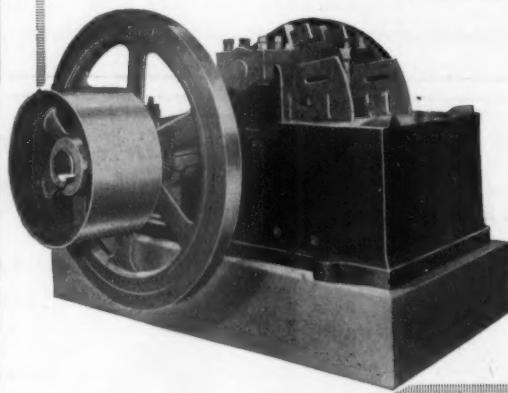
Traylor Engineering & Mfg. Co.
Main Office and Works
Allentown, Pa.

New York Office
24 Church St. Western Office
Salt Lake City

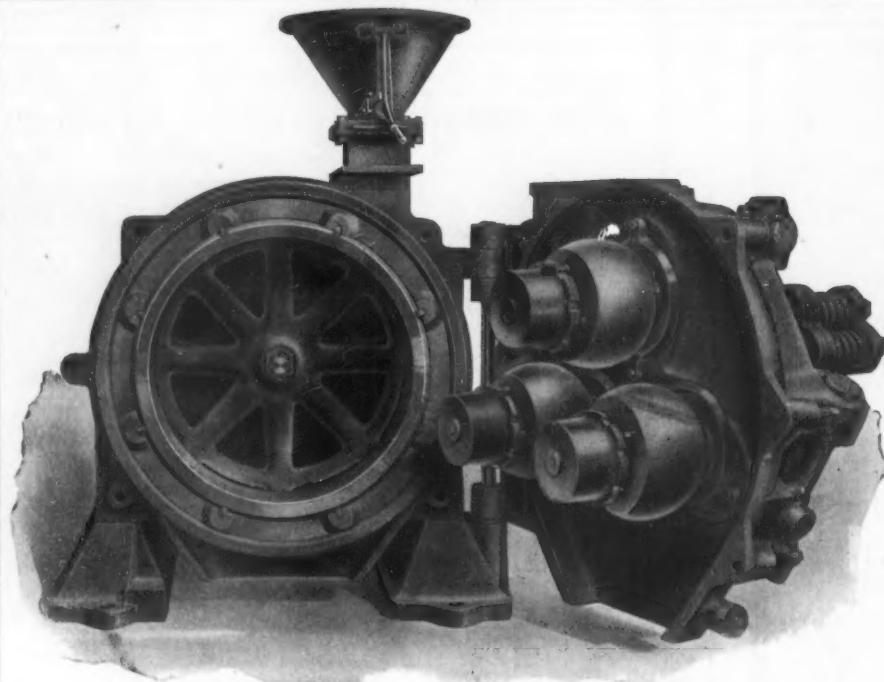
A Comparison of costs is always valuable

Why not write us today to explain the economical features of the

Blake Type Crusher



Webb City & Carterville Foundry and Machine Works
WEBB CITY, MISSOURI



RING-ROLL MILL GRINDING PRINCIPLE

This Ring is revolved just fast enough to hold the feed (which passes onto it) by centrifugal force. The rolls are strongly pressed outward against this layer of material and are driven by friction against it, thus the material is crushed and ground upon itself and discharged freely from both sides of the ring.

SEND FOR CATALOGUE

STURTEVANT MILL COMPANY, BOSTON, MASS.

STURTEVANT
RING-ROLL MILL
for
PULVERIZING

LIMESTONE, CEMENT CLINKER, GRANITE, TRAP, QUARTZ ETC., TO FROM 10 TO 100 MESH.

BUILT IN 5 SIZES
Capacities from 1 to 30 tons per hour.

OPEN DOOR ACCESSIBILITY

Open the door and every grinding part is in sight and within easy reach for replacement.

Slow Speed: The ring revolves at 63 R. P. M. No vibration, no noise. Practically dustless.

Roller bearings reduce power to minimum. 40 H. P. operates the largest single mill.



Sand Washing Plant installed for the Wyoming Sand and Stone Co.

Gravel Washing Plants

The design of your Sand and Gravel Washing Plant demands the best expert attention. The Kind of machinery you install greatly determines whether you are to get successful operation and profit or trouble and loss.

Methods for handling Sand and Gravel are being constantly improved. We have developed machinery for more effective washing and screening and for economy of room, with greater capacity.

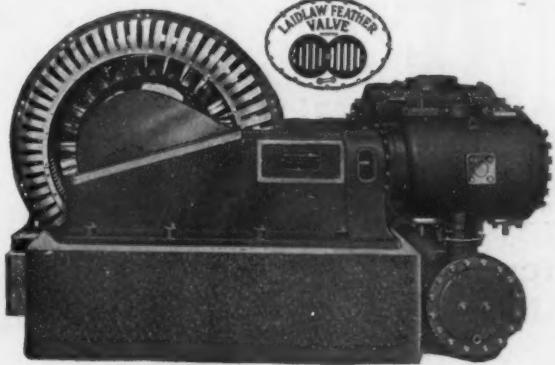
Increased Simplicity and Results. Cut down amount of labor required.

Use mechanical settling tanks that produce dryer and cleaner sand and operate without attention to "Automatic" parts.

Let us help figure your problems

The Good Roads Machinery Co., Inc.
Fort Wayne, Indiana

Kennett Square	Pa.	Commercial Trust Bldg...Philadelphia, Pa.
Des Moines	Iowa	602 Oliver Bldg.....Pittsburgh, Pa.
50 Church Street.....	New York, N. Y.	1211 W. Main St.....Louisville, Ky.
79 Milk Street.....	Boston, Mass.	Tenn. Trust Bldg.....Memphis, Tenn.
		38 Madison Ave.....Atlanta, Ga.



LAIDLAW Feather Valve COMPRESSORS

include features which greatly increase the return heretofore possible for money invested. These machines have established notable records for low operating costs. Described in detail in Bulletin L-530-58.

Write for a copy

WORTHINGTON PUMP AND MACHINERY CORPORATION

Successor to International Steam Pump Co.
115 Broadway, New York

Laidlaw-Dunn-Gordon Plant, Cincinnati, Ohio
Branch Offices in all Principal Cities

L281.2

This Is Our Type "F" Bucket

Write us your condition and requirements and we will advise you if our equipment is adapted to your work

The Cable Excavator Co.
Commercial Trust Building,
PHILADELPHIA, PENNA.



The Brainard Pulverizer

Positively does not grind the material, works by impact only and will handle either wet or dry feed. All principal wearing parts are made of the best grade of manganese steel, and the casing is steel lined throughout.

A guaranteed Pulverizer, strong, durable and efficient. Made in four sizes.

WRITE FOR FURTHER INFORMATION
Midland Crusher-Pulverizer Company
Old Colony Building, Chicago

SIX REASONS

Why the Stedman Pulverizer Is Efficient

1. Large capacity.
2. Uniform product obtained.
3. Minimum horse power required.
4. Long life of the hammers.
5. Strong, rigid type of screens.
6. Low cost of repairs.

If any of these items are troubling you, Write us.

ESTABLISHED 1884

STEDMAN'S FOUNDRY & MACHINE WORKS

(Manufacturers of disintegrators, pulverizers, grinders, mixing machines of all kinds, dump cars, shaker and revolving screens, elevators, conveyors, pulleys and sprocket wheels. Designers of complete crushing, grinding, mixing and screening plants.)

AURORA, INDIANA, U. S. A.

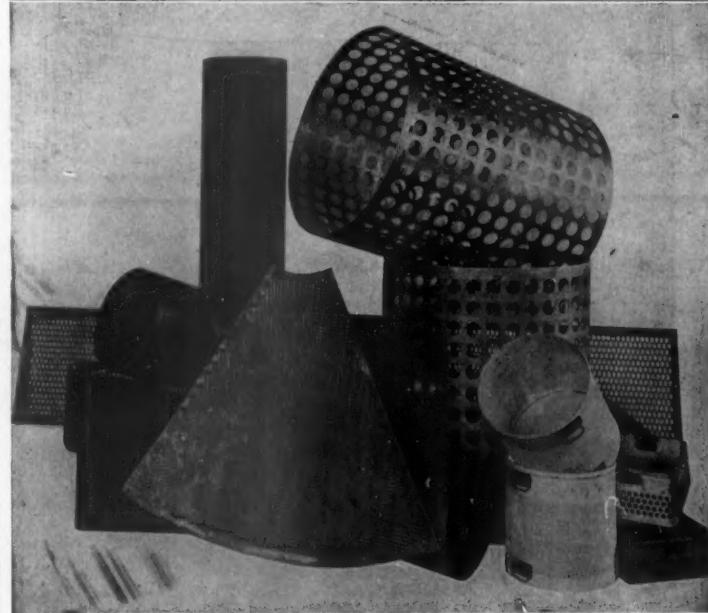
Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

The
**Toepfer
 Hydrator**

was two years in continuous use at one plant working ten hours daily before being put on the market. Another machine installed last season will pay for itself in one year at its present rate of saving over former methods. This machine was started by an inexperienced man and turned out a first class product from the very first day. THAT SHOWS THE SIMPLICITY OF THE TOEPPER HYDRATOR.

W. Toepfer & Sons Co.
 MILWAUKEE

PERFORATED METAL
 Steel Screens Iron and Steel Work



ELEVATOR BUCKETS, STEEL TANKS, ETC.
W. TOEPPER & SONS CO.
 84 Menominee St. ESTABLISHED 1855 Milwaukee, Wis.

HYDRATED LIME

Its Marvelous Increase In Consumption

**The Kritzer
 Service**

Any lime can be successfully hydrated by our process; but whether your lime can be hydrated and successfully marketed is another question. We study your proposition and the possibilities of its commercial success, and advise you accordingly. Our ten years' experience in the business is a valuable assistance in this. Ours is not a mail order proposition. We investigate our customers' proposed plant thoroughly before we will enter into a contract with them. We turn down more prospects than we advise to go into the business. We can't afford to have any failures. Our customers' success is our success.

WRITE TO US

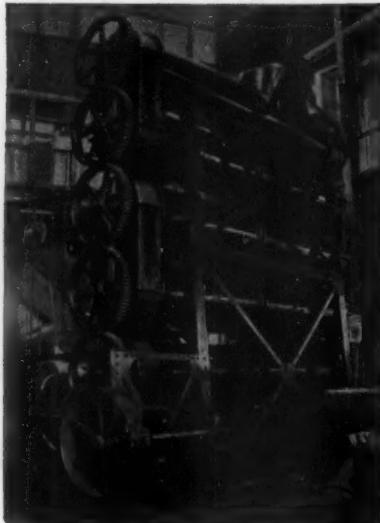
**Are You Meeting the Increasing
 Demand for Hydrated Lime?**

There is nothing forced or unnatural about the growing popularity of this product. It is a natural growth resulting from a widespread awakening to the advantages of Hydrated Lime for a variety of uses—as waterproofing for Concrete, in wall plaster, and in almost every case where lime is called for. In hydrated form it is weatherproof, more easily handled, and better adapted to modern methods, both of commerce and construction. A continued growth of the demand may therefore be expected.

The Kritzer Way

insures a product which will hold a continued place for itself on the market. We install plants complete, designed by our own expert engineers to meet your local conditions and turn out a uniform grade of Hydrated Lime of the highest standard, and with the greatest economy in cost of production. The Kritzer Continuous Hydrator, and the accessories installed with it, are the recognised standards in this line.

THE KRITZER COMPANY **Chicago, Ill.**



KRITZER CONTINUOUS
 PROCESS

Measure the ERIE by Ability

Men are buying shovels these days based on their ability. This accounts for the marked preference given the

ERIE Revolving Shovel

Weight, dipper capacity, engine sizes, etc., all mean something, but it's *actual performance* which tells the tale.

Let us refer you to some nearby ERIE owner, whose requirements are similar to your own.

Bulletin R-12 gives full particulars. Copy?

Ball Engine Company, Erie, Pa.



Clyde Hydrator with Hood
"The common sense way"

SIMPLICITY IS THE KEYNOTE OF SUCCESS

IT does not take a "master mind" to install a CLYDE Hydrating plant, nor does it take a "high priced" engineer to run one. If **YOU**, Mr. Lime Manufacturer, realized how simple it is to obtain a **PERFECT HYDRATE**, with the CLYDE HYDRATOR you would place your order with us by FIRST MAIL. Write us today—NOW, and let us explain to you what CLYDE PROCESS hydrated lime is and how to obtain the best results, then

Use your own judgment—it's up to you

H. MISCAMBELL, Duluth, Minn.

Patentee and Sole Manufacturer

SATISFACTION brings "repeat" orders



6 KEYSTONE KILNS, UNION CARBIDE CO., SAULT STE. MARIE, MICHIGAN

A recent order from the Union Carbide Co., illustrates the value of a Steacy-Schmidt installation—After operating six Steacy-Schmidt kilns successfully for over 10 years, this company has recently ordered 6 new kilns, in addition to the present plant.

The engineering department of the Steacy-Schmidt Mfg. Co. are at the services of any firm interested in efficient methods for crusher plants, lime kilns and hydrating plants. "Success Builders for the limestone industry"

Steacy-Schmidt Mfg. Co.
York, Pennsylvania

Manufacturers of the famous Keystone kilns—183 now in use.

Trap rock, sand, gravel, coal, coke, ashes, etc., can all be loaded into your trucks at the rate of

1 cubic yard per minute
with a

HAISS WAGON LOADER

for a cost of less than one cent per cubic yard for electric or gasoline power

This loader is different from all other machines of this type—it DIGS—the others only elevate the material. Write us for more information. Do so while you think of it.

Geo. Haiss Mfg. Co.
146th St. and Rider Ave.
NEW YORK CITY



In Successful Operation

The Negley Excavator



The dragline slack cableway excavator for all operations—discharges fast or slow as desired at the mast or anchor.

Economy in Operation and Maintenance

Indianapolis Cable Excavator Company 216-18 Mass. Ave.
Indianapolis, Ind.

Why Not Modernize Your Yard?

You may have the latest type of Crushers, Auto Trucks, etc., but if your equipment does not include a



McMYLER INTERSTATE CRANE

to handle materials, shift cars, place your screens, load trucks and a hundred other things you are losing a legitimate part of your profits. We will be glad to submit figures if you are interested in improving your yard conditions. Bulletin on request.

Address inquiries to
the nearest office

The McMyler Interstate Co., Dept. P-5, Cleveland, Ohio

Chicago, New York
London



Labor Saving Equipment

is an important factor where wages are high and men are scarce.

The Dull Cableway Excavator

is an efficient bucket especially adapted for gravel plants, loading cars, digging bank material or for under water work

Rapid and economical operation

The Raymond W. Dull Co.
1914 Conway Building
Chicago, Ill.

We design and equip gravel washing plants of any capacity. Our catalog "Plants for Washing Sand and Gravel" sent upon request

A Well Equipped Plant



THE Baltes Stone Co., desired to purchase the very best Locomotive Crane money could buy—and as the photo shows we painted their name on an Ohio Crane.

Ask them why they thought the "Ohio" was the best one

90% of the "castings" are basic open hearth steel

Write for Catalogue No. 11

Ohio Locomotive Crane Co., Poplar St., Bucyrus, O.

30 Church St.	New York	Edward R. Bacon Co.	San Francisco
Fisher Bldg.	Chicago	Contractors Equip't Co., Seattle, Portland	
Home Life Bldg.	Washington, D. C.	N. C. Walpole.	Birmingham, Ala.
Oliver Bldg.	Pittsburgh	950 Rockefeller Bldg.	Cleveland, O.
Kelly, Powell, Ltd.	Winnipeg, Montreal		



YOU WILL DO BETTER
With an **OSGOOD**

Osgood "18" $\frac{3}{4}$ yd. Traction revolving steam shovel is the practical shovel for the lighter class contracting, such as road building, cellar excavating, sewer trenching, gravel pits, etc.

Osgood "43" $1\frac{1}{2}$ yd. Traction Steam Shovel with spur gear drive, for quarry and heavy contract work.

Write us your requirements

THE OSGOOD CO., Marion, O.



DID YOU EVER FEEL THE NEED OF A
LIGHTER, CHEAPER, SIMPLER LOCOMOTIVE CRANE?

mounted on road wheels to run anywhere?

BYERS

AUTO-CRANE

Fills that need. We will tell you all about it.

Chicago Office: 1440 Monadnock Bld.
Cleveland Office: 601 Sincere Bldg.

The John F. Byers Machine Co.

310 Sycamore St., Ravenna, O.
(HOISTING ENGINES AND DERRICKS)

YOUR PAN NEEDS

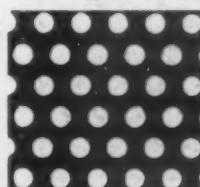
THIS pan is the identical pan required for your plant and it should speak to you convincingly of our pan quality. It has put many Sand-Lime Brick Plants on a paying basis and will make money for you. There is no line of pans made which will compare with the "Built Right, Run Right" line and your needs can be fully taken care of from our peerless line. We build pans with a range in size and capacity to meet any need. These pans are adapted for all the work that any pan will do. We have them in both belt and motor drive and will be pleased to give you any points on our pans that you may inquire about.

A poor pan is an expensive proposition. Its inefficiency shows in the quality of your product and the size of your repair bills. It also limits your capacity by handicapping the rest of the equipment. Real economy would suggest that your pans be the best possible. We will be pleased to talk pans or any other equipment with you.

We Build Complete Equipments for
Sand-Lime and Clay Brick Plants

The American Clay Machinery Co.
Willoughby, Ohio, U. S. A.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



"HENDRICK"
PERFORATED STEEL SCREENS AND
ELEVATOR BUCKETS

STAND THE TEST—
Let us figure on your requirements.

HENDRICK MFG. CO.
New York Office, 30 Church St. CARBONDALE, PA.



Special rope made to order to suit any purpose

American Steel & Wire Company

Chicago New York Cleveland Pittsburgh Worcester Denver

Export Representative: U. S. Steel Products Co., New York
Pacific Coast Representative: U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle

HOISTING rope of every description for elevators, mines, coal hoists, ore hoists, conveyors, derricks and cranes, stump pullers, steam shovels, dredges, skidder rope for logging, ballast, unloading. Towing hawsers, mooring lines, tiller rope, and ship's rigging. Power transmission. Suspension bridge cables. Rope for all haulage purposes. Flattened strand rope. Non-spinning rope. Steel clad flattened strand rope. Non-spinning rope. Steel clad rope. Locked coil track cable for aerial tramways. Flat rope.

Distributing Material to Storage Pile or Spoil Bank

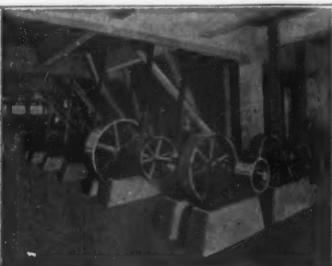
THE LOOP LINE TRAMWAY

with its continuous procession of barrows may be readily adapted to the distribution of material anywhere along the line by the simple expedient of equipping the barrows with drop bottoms and the track with a movable tripping device which automatically unlatches the bottoms at any desired point. This is but one of many services to which Loop Line Tramways are adapted.

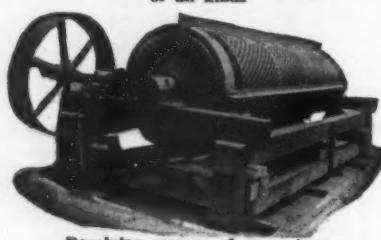


*Let Us Help You with
Your Problem!*

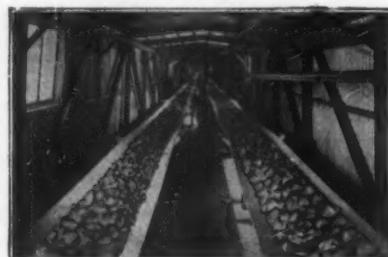
Amburseen Company
61 Broadway New York City



Complete power transmission equipments
of all kinds



Revolving screens of every type
for every purpose



Belt conveyors for any material.
10 to 60 inches wide.

WELLER-MADE EQUIPMENT

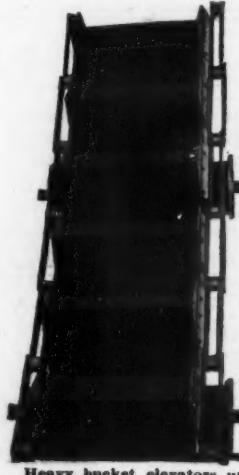
For Stone and Gravel Plants

MEANS economy in operation and 100% capacity in production—Screens of all types, bucket elevators, power transmission and conveying equipment, etc., are designed for the most efficient methods of handling your material.

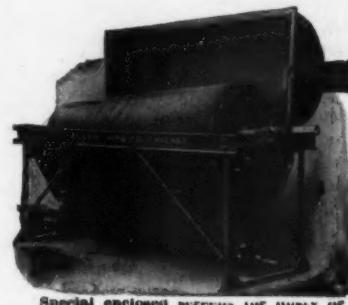
IT'S WORTH EVERY CENT WE ASK FOR IT.

Write for general
catalog P-20

WELLER MFG. COMPANY
CHICAGO



Heavy bucket elevators up
to 84" wide and 30" pitch



Special enclosed bins for dusty or
fine materials

4 Pierce-Arrows Displace 20 Teams and Save 20% on Horse Delivery Costs

The Rodgers Sand Company of Pittsburgh, Pa., has used Pierce-Arrow Motor Trucks for four years. Counting all items, including depreciation and labor, they figure that a 5-ton Pierce-Arrow Truck costs \$20 a day to operate and maintain. Each of their Pierce-Arrows displaces five teams each of which cost the Rodgers Sand Company \$5 a day to operate. The saving effected by each truck in replacing five teams is therefore \$5 a day or 20%.

Greatest Mileage and Tonnage in Fourth Year

Their first truck, a 5-ton Pierce-Arrow, ran a bigger mileage and carried a greater tonnage than ever before in its fourth year of service. The figures on this truck's performance will interest anyone who has an exaggerated idea of the depreciation on a high-grade truck.

In 1915, the truck was pushed hard in night work on big jobs. After three years of hard service it was able to withstand this strain of extra work and actually eclipsed its own records.

Year	Mileage	Tonnage
1912 (8 mos. only)	9,760	3,976
1913	9,788	4,332
1914	9,745	6,415
1915	13,256	10,846
	42,549	25,569

The Rodgers Sand Company feels equipped to handle any job with the Pierce-Arrow Trucks. They have frequently worked them all night in order to finish a rush job on contract time.

A number of other interesting installations are shown in our booklet, "What Pierce-Arrow Motor Trucks Are Doing in the Contracting Business." We shall be glad to send you a copy.

THE PIERCE-ARROW MOTOR CAR CO., Buffalo, N. Y.



The Worm-Gear

All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

What One Dealer Says— about Medusa Waterproofing

Watertown, N. Y., December 15, 1915.
The Sandusky Cement Co.,
Cleveland, Ohio.

Gentlemen:

I have used and sold Medusa Waterproofing for the past ten years. It gives the best results in all work and can be depended upon to resist all moisture. Medusa was specified by D. D. Kieff, architect, for the New York Trust Building, this city, and I am pleased to recommend its use to anyone wishing a good waterproofing.

Yours truly,
S. W. JOHNSON,
(Cement, Lime and Mason Supplies).



Every dealer should handle Medusa. It will increase your profit and sales.

Write today for complete information and Dealer's proposition

The Sandusky Cement Co.
Department V-3, Cleveland, Ohio



Turnovers or Leftovers?

Rapid turnovers stimulate and develop your business. Leftovers will kill it.

Lehigh Cement for three reasons has a rapid turnover; first—its advertising stimulates concrete construction; second—its national reputation makes it the logical choice of each new cement buyer; and third—its Uniform quality insures satisfied customers.

Our selling help will enable you to make cement turnover rapid and increase cement profits.

LEHIGH PORTLAND CEMENT CO.



CONCRETE FOR PERMANENCE

MILLS:

Ormrod, Pa.; West Coplay, Pa.; Foglesville, Pa.; New Castle, Pa.; Mitchell, Ind.; Mason City, Ia.; Metaline Falls, Wash.

OFFICES:

Allentown, Chicago, Spokane, New York City, Philadelphia, Boston, Minneapolis, Jacksonville, Mason City, New Castle, Buffalo, Pittsburgh.

12 Mills—Annual Capacity Over 12,000,000 Barrels

AMERICAN PROCESS CO.
68 William St., NEW YORK CITY

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

JUL 26 1916
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Rock Products and BUILDING MATERIALS

INCORPORATING DEALERS BUILDING MATERIAL RECORD

Volume XVIII.

CHICAGO, JULY 22, 1916.

Number 6.

PUBLISHED SEMI-MONTHLY.

DEVOTED TO

Quarry Products, Cement, Lime, Plaster, Sand and Gravel, Clay Products and Building Specialties—Fireproof Building and Road Construction.

THE FRANCIS PUBLISHING COMPANY.
EDGAR H. DEFEBAUGH, Pres.

Seventh Floor, Ellsworth Bldg., 537 So. Dearborn St., Chicago, Ill., U. S. A.
Telephone: Harrison 8086, 8087 and 8088.

EDITORS:

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H. F. AKE, Secretary.
DRUSUS H. NICHOLS, Advertising Manager.

Communications on subjects of interest to any branch of the industry are solicited and will be paid for if available.
Every reader is invited to make the office of Rock Products and Building Materials his headquarters while in Chicago.
Editorial and advertising copy should reach this office at least five days preceding publication date.

TERMS OF ANNUAL SUBSCRIPTION.

In the United States and Possessions.....\$1.00
In all other Countries in the Postal Union.....\$1.50
Subscriptions are payable in advance, and in default of written orders to the contrary, are continued at our option.
Advertising rates furnished on application.

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under act of March 3rd, 1879.
Copyright, 1916, by E. H. Defebaugh.

The time of mid-summer meetings has arrived. Dealers always benefit by getting together for mutual good. It is pleasing to note the various meetings are well attended.

Orders for products of the quarry are plentiful. In most cases prices are fair to good. When these products are sold at a loss, a revision of the system of production or a change in the selling price will alone save the day.

The unprecedented condition of the building industry bespeak prosperity for the entire line of building material manufacturers, if sales are made at prices which have taken into consideration all manufacturing, overhead and selling costs.

During the month of June, the eastern cement market reported a demand below normal, but advices during the first three weeks of July are to the effect that conditions have adjusted themselves and today there is a healthy demand, with prices firm.

Farmers are beginning to realize the value of pulverized limestone on soils. The increased demand for agricultural limestone is evidence of this fact. When the soil is properly analyzed, the use of this product becomes more scientific and reliable—and the results more profitable.

The passing and approval of the Bankhead bill, calling for the expenditure of \$85,000,000 by the Government and \$75,000,000 more by the various states for road building, should lend encouragement to automobilists and other good road enthusiasts, as well as to road builders and material producers.

The rehandling of sand, gravel and crushed stone by retail dealers is becoming simplified through the use of modern handling and delivery equipment. Wherever installed, these up-to-date devices pay handsome profits. They also solve to a large extent the troublesome labor problems, by reducing the number of men necessary around the yard.

There is much room for improvement in the operation of every building material yard in the country. Are you giving the proper amount of thought to the warehousing, handling and delivery of materials? Are you satisfied with the present manner in which you handle your empty sack problems? Are you securing the utmost efficiency from your motor trucks and teams? Stop and reflect; then act.

The demand for properly graded concrete aggregates is compelling sand, gravel and crushed stone producers to readjust their plants where the proper amounts of the desired sizes are not forthcoming. Where the excess amounts are made up of the larger size aggregates, it is easy to install a crusher above the bins, where it can receive its supply from one screen, crush it and pass it on to the next smaller screen.

Service rooms for the use of prospective builders are valuable adjuncts to retailers of building materials. Here can be kept samples of the different materials and literature relative to their durability and use. The room can also be used by them for private discussions of their plans. The upkeep cost is practically nothing but the returns are manifold. Write the editors about your problems in this respect. Maybe we can be of assistance to you.

The Fourth of July, 1916, was celebrated with a real movement of troops to the Mexican border. Now everybody is in favor of preparedness without regard to party or creed or previous condition of apathy towards the militaristic spirit of the times. The whole procedure is hardly felt in the channels of business for the reason that the whole Mexican matter has long been discounted. The building and improvement business is nearer to the normal level than any other line.

Little dealers in builders' supplies will find it quite important to keep an accurate cost system of their operations. Big supply houses have long realized that they simply can't keep house without a rigid rule of cost finding. The staples of cement, lime, plaster, crushed rock, sand, brick and tile are the cheapest commodities known to man when measured by the ton. It is tons and fractions thereof that is the whole thing with your delivery service that costs every dealer much money. If your cost system is based upon tons delivered by your teams and trucks, you can at least find out whether your margin is netting you anything or not. Some very surprising facts are developed whenever a dealer first begins to install a cost-keeping system. They are always vital facts, worth all they cost to get acquainted with as you will soon find out.

WITH YOU and ME

A. T. Osborn succeeds Osborn Bros. at Healy, Kan.

H. W. Chadwick bought the Willis Lucas yard at Agency, Mo.

Nelson Davidson, of Graf, Neb., has sold his yard to Clarence Wright.

The Cressler McCallum Co., Ashland, Kan., has gone out of business.

Edward Olson has succeeded the Tidball Lumber Co. at Tecumseh, Neb.

Kirkbride & Son have bought the Deckman and Taylor yard at Chula, Mo.

R. J. Rupprecht has bought the Yost and Asmus Lumber Co.'s yard at Cedar Rapids, Neb.

John Casey, of Zurich, Kan., spent a part of July in Excelsior Springs, Mo., as his vacation.

The Bennett Lumber Co., Kansas City, Mo., has bought the O. W. Sundeen yard at Burdick, Kan.

A. T. Wheeler, of Wheeler & Son Co., Corning, Neb., has been spending his vacation at Colorado Springs.

The Stroup Lumber Co., Salina, Kan., has recently purchased the Ernst Schwartz yard at Norton, Kan.

The V. S. Cook Lumber Co., Coalgate, Okla., has added to its line the Atoka yard of the Caylor Lumber Co.

Van Ackeron Bros., of Cedar Rapids, Neb., have erected a new shed that is both ornamental and well arranged.

The Saunders Bros. Lumber Co., North Kansas City, Mo., has been succeeded by the North Kansas City Lumber Co.

The Smith Hovelson Lumber Co., Sioux City, Ia., has sold its Correctionville yard to the Smith Thieben Lumber Co., Osage, Ia.

Tom Black, manager for Morrison and Black, at Geary, Okla., has just completed a new double deck shed, 36x104 feet.

The John Halloren and Ashby Lumber Co., Ashby, Neb., have been consolidated and are operating under the name of the former.

The C. J. Harris Lumber Co., of St. Louis, Mo., has taken over the yards of W. H. Mengel Lumber Co., at California, and Sandy Hook, Mo.

Andrew Aitken, of St. John, Kan., bought the yards of the Western Lumber & Supply Co., at Coldwater, Dillwyn and Macksville, Kan.

T. F. Martin, formerly manager for J. Thomas & Son at Meriden, Kan., has bought the Tiede Lumber Co.'s yard at Enterprise, Kan.

Robert Murphy, manager Gafford Lumber Co., Oak Hill, Kan., has resigned his position, joined the

Kansas state militia and is now at Fort Riley.

The W. W. Jarnagin Lumber Co. has bought the yards of the Grove Lumber Co. at Dodge and Grove, Okla., and Southwest City, Mo. Headquarters will be at Grove.

M. T. Bryan, of Mullinville, Kan., has added a line of phonographs to his stock and now entertains his patrons with music when they call for building materials.

G. L. McLane, city engineer, Hutchinson, Kan., who is now on the Mexican front with the boys, reports that their location is just thirty feet from the center of Hell.

L. W. Burgess, manager of the Edwards Nichols Lumber & Supply Co., at Spearville, Kan., recently spent a week with his family at their summer camp, at Lake Tahoe, Kan.

L. C. Jones is now manager of the Farmers Co-Operative Association at Nickerson, Neb., succeeding A. Sinamark, who has gone into the automobile business at North Bend.

The Farmers Union Co-Operative Association has bought the yard of Bowman Kranz Lumber Co., at Craig, Neb. J. J. Bennett, who has been manager for fifteen years, will continue.

S. C. McConnell, for some time manager of the Long Bell yard at Watonga, Okla., has been transferred to the auditing department of the Long Bell general offices at Kansas City.

The Octavia Lumber & Coal Co. has taken over the yards of the Updike Lumber & Coal Co., at Bee, Cordova, Octavia and Thayer, Neb. Headquarters of the new company are at Octavia.

The Long Bell Lumber Co. and F. D. Misener have closed their Oilton, Okla., yards. This leaves four yards in what was one year ago a nine-yard point. The rise and fall of Oilton is typical of most oil towns.

One of the oldest and most active retail yard managers is to be found in Mr. Stabler, who is in charge of Logan-Moore's operations at Coweta, Okla. He is seventy-six years old and a veteran of the Civil War.

Oscar H. E. Ochs, Allentown, Pa., a member of the firm of the Ochs-Frey Brick Co., was recently married to Miss Alice E. Sehantz, at Morristown, N. J. Mr. Ochs is a popular man in the building trades in Allentown.

A banquet in honor of the sixteen employees of the California Portland Cement Co., who will represent that company at the Monterey training camp, was given at the First Presbyterian Church in Colton, Cal., on July 8.

The Portland Cement Association recently opened a branch office at 101 Park avenue, New York City, to promote the general use of cement, but will direct its efforts more particularly toward advancing the interest in concrete roads.

The entertainment committee of the Pittsburgh Builders' Exchange, which handled the recent picnic so well, were accorded such high praise in connection with that event that they contemplate holding a moonlight boat excursion about the middle of August.

The name of the organization known as the Vitrified Clay Industry, with offices in the Wyandotte building, Columbus, O., has been changed to that of the Sewer Pipe Manufacturers' Association. The latter association will have offices at 519 National building, Akron, O.

C. C. Dingee, manager of Peoples Lumber & Coal Co. yard at Beloit, Kan., has accepted a position with the Chicago Lumber & Coal Co., St. Louis, Mo., as traveling salesman in Oklahoma and will start on Aug. 1. A. V. Longenecker, formerly manager of Leidigh & Havens yard, Barnard, Kan., will succeed him as manager at Beloit.

The Center Lumber Co., Fennimore, Wis., has been organized to take over the business of the Wisova Lumber Co. of that city. A modern new building is being erected alongside tracks to facilitate handling building materials and other products. L. D. Eastman, Lancaster, Wis., is president of the new concern and Grant Lewis is general manager and secretary.

A. Steinmetz recently resigned his position as general manager of the Western States Portland Cement Co., to become secretary to Harry F. Sinclair, former Federal League magnate and president of the Sinclair Oil and Refining Co. This corporation is the new \$70,000,000 company organized in the spring. Mr. Steinmetz will have offices in Tulsa, Okla.

Harry F. Wight, one of the most genial salesmen of the Edison Portland Cement Co., is temporarily confined to his home owing to a broken ankle sustained while alighting from a car in Staten Island. Mr. Wight is keeping his cheery smile ever before the dealers in Jersey and New York via the "Hello Route." Surely such perseverance is bound to bring success, and it will take more than a broken ankle to keep him out of the running.

Edward Jens, president of the New Idea Plaster Board Co., South Milwaukee, Wis., was very seriously injured at Fond du Lac, Wis., recently, when thrown from the seat of his buggy. A heavy wagon backed into his buggy just as he was passing around the rear of it. He received a double fracture of the thigh bone. Mr. Jens lives at Fond du Lac, where the company has been operating a plant. A new plant is being erected at South Milwaukee and operations there are about ready to be started.

The Moseman & Heyne Co. has taken over the yards and business of the Holmquist Grain & Lumber Co. at Pender, Emerson and Thurston, Neb. John Moseman is president and Herman G. Heyne is secretary. The general office is at Pender, and Mr. Heyne will manage the yard at that point. W. E. Albaugh will be manager at Thurston and A. Erickson will remain as manager at Emerson where he has been with the Holmquist Co. for many years.

J. D. Traylor, manager for Superior Lumber Co., at Cushing, Okla., went with the Oklahoma Shriners on their trip to Buffalo.

Max Kushlam, employed in the Chicago brick department, and a member of Company A, Illinois engineers, who returned to Chicago from San Antonio on June 20 for a week's furlough, declared stories about rotten food and insanitary conditions are untrue. "We are having a good time," he said, "although some of the boys are anxious to get home. The camp was only wet one day, and is sanitary now, and there is practically no sickness."

Plans are being made by the Nashville Builders' Exchange for a large increase in membership. As an encouragement to joining at the present time, the membership rate has been reduced to ten dollars for the month of August, provided that applications are received in clubs of ten or more. It is intended to have a committee from each trade call upon all non-members in that branch. It is hoped to increase the membership considerably during the summer.

C. M. Wood, manager of the Cement Products Bureau of the Portland Cement Association, visited Kansas City last week on an inspection test. At the same time N. T. Ashkins was in western Michigan and H. A. LaRoy was in Minnesota promoting the use of cement products. During this time F. R. Carty represented the bureau in the Chicago office. Mr. Carty, who is a former tennis champion, is enthusiastic over concrete tennis courts and never misses an opportunity to advocate their use wherever tennis is played. At the present time he is conducting a campaign for the purpose of having the National Lawn Tennis League adopt concrete for championship courts.

Director of Sales J. F. Bowman, of the Federal Motor Truck Co., Detroit, Mich., announces the appointment of V. K. McBride as assistant sales manager. Mr. McBride has been in the sales department for over two years. The appointment of H. A. Conlon as field sales manager has also been announced by Mr. Bowman. Mr. Conlon, who hails from New England, has been a special sales representative of the company for some time. His new duties will take him into various sections of the country to work with the district sales representatives of the Federal company. An enthusiastic sales conference was held at the company's office the week preceding the World's Salesmanship Congress at Detroit, when the various district sales representatives of the company met with Mr. Bowman, to discuss sales plans for the next few months. Every man present brought optimistic reports of the outlook for truck sales in his territory. The following district salesmen were present at the conference: L. C. Long, L. W. Phillips, J. I. Martin, E. D. Jones, W. S. Hill, R. S. Smith, J. A. Holihan, and H. M. Rosenberg. Mr. Rosenberg, formerly branch manager of the White Co., at St. Louis and for five years a member of the White sales force, has joined the sales department of the Federal company as a traveling district representative. He is one of the oldest salesmen in the truck industry, having built one of the first commercial vehicles in the country over sixteen years ago. He will represent the Federal in western territory.

NEWS OF WESTERN RETAILERS.

C. F. Lucas, of the Willis Lucas Lumber Co., line yard operators of St. Joseph, Mo., is quite a golfer, particularly in the mud. He played in a Kansas City tournament recently and had opportunity to show his ability as a mudder. But golf is the only game he would stay out in the rain to play.

The yard of L. H. Hedges at Chase, Kan., has been sold to the Drieling Lumber Co.

The Palace.

When I was a King and a Mason—a Master proven and skilled—I cleared me a ground for a Palace such as a King should build. I decreed and dug down to my levels. Presently, under the silt, I came on the wreck of a Palace such as a King had built.

There was no worth in the fashion—there was no wit in the plan—Hither and thither, aimless, the ruined footings ran—Masonry, brute, mishandled, but carven on every stone: "After me cometh a Builder. Tell him, I too have known."

Swift to my use in my trenches, where my well-planned ground-works grew, I tumbled his quoins and his ashlar, and cut and reset them anew. Lime I milled of his marbles; burned it, slaked it and spread: Taking and leaving at pleasure the gifts of the humble dead.

Yet I despised not nor gloried; yet, as we wrenched them apart, I read in the razed foundations the heart of that builder's heart As he had risen and pleaded, so did I understand The form of the dream he had followed in the face of the thing he had planned.

When I was a King and a Mason—in the open noon of my pride, They sent me a Word from the Darkness—they whispered and called me aside. They said, "The end is forbidden." They said, "Thy use is fulfilled; Thy Palace shall stand as that other's—the spoil of a King who shall build."

I called my men from my trenches, my quarries, my wharves and my sheers. All I had wrought I abandoned to the faith of faithless years. Only I cut on the timer—only I carved on the stone: "After me cometh a Builder. Tell him, I too have known."

—Rudyard Kipling.

M. R. Smith, of Kansas City, Mo., has purchased the interest of O. J. Raymond, of Independence, Mo., in the O. J. Raymond Lumber Co., and the company will be known hereafter as the M. R. Smith Lumber & Shingle Co.

The Big Lake Lumber Co., of Big Lake, Texas, recently sold its sheds and stock to the Barnhardt Mercantile & Lumber Co.

A new retail yard has just been completed and stocked at Greenville, Texas, by the Hunt County Lumber Co. The company will be in charge of Mr. Peerson, a well-known Texas lumberman.

Offices have been opened recently at Miami, Okla., by the Home Building & Lumber Co.

A new retail yard has been established at Albuquerque, N. M., by the Gibson-Faw Lumber Co.

The Turner Lumber Co. has established a new retail yard at Lincoln, Texas, which gives it four yards altogether.

A new retail yard has recently been established at Dacoma, Okla., and will be known as the Farmers' Grain & Lumber Co. The company is a corporation capitalized at \$5,000, the incorporators being O. L. Glasgow and C. F. Stoner, of Dacoma, Okla., and Alex Davis, of Alva, Okla.

F. E. Demuth succeeds Demuth and Shepherd at Ellsworth, Kan.

W. J. Rumbel bought out G. L. Merrill at Moran, Kan., and consolidated the two yards.

The Hutchinson Lumber & Planing Mill Co., of Hutchinson, Kan., has purchased a large ten-ton motor truck.

G. A. Curtis has been appointed manager of the Lindas Lumber Co.'s yard at Ford, Kan., succeeding M. H. Smith.

F. A. Fortna, of the Fortna Lumber Co., Bucklin, Kan., has returned from a three-weeks' pleasure trip in the Colorado mountains.

T. M. Deal Lumber Co. has sold its yard at Cullison, Kan., to the Peoples' Lumber Co. B. T. McDaniel is the manager.

R. L. Baldwin, of the Liberal Lumber Co., Liberal, Mo., has recovered from his illness. He is spend-

ing the last few weeks of his convalescence in Sulphur Springs, Ark.

Brandon Bros. Lumber Co. is erecting an addition to its sheds at Union, Neb., which will be 60x90 feet and will give it a splendid storage capacity.

Roscoe Collins, of Collins Bros., at Penoke, Kan., spent his vacation in Colorado.

Clarence Sooy has been transferred from Long Bell Lumber Co.'s yard at Oilton, Okla., to the yard in Shamrock.

FACTS ABOUT OUR MERCHANT MARINE.

A new angle of vision on our shipping is afforded if we consider tonnage instead of values as the element by which to measure our merchant marine. It has been freely and accurately stated that only a small part of our exports is carried abroad under the American flag—something like eight to twelve per cent. In values measured in dollars and cents, it is true that the last four years have seen anywhere from 88 to 92 per cent of our exports carried from the United States in ships flying the British, German and other foreign flags.

It is equally true that, in tons of merchandise, one-fourth of our exports even in 1891 went out of the country under the American flag. In 1916 the official reports when compiled will show that something like 35 per cent of the tonnage of our exports were borne away in American ships—one-tenth in value, it is true, but one-third in bulk. And this great increase has taken place in spite of the fact that the amount of our exports has considerably more than doubled. In other words, the carrying capacity of our merchant marine has grown at even a greater pace than our rapidly mounting exports. There is no question that we need more of an American merchant marine. There is also no question but that we are getting it at a rate of increase greater than that of our present abnormal commercial expansion beyond the seas.—The Nation's Business.

The RETAILER

AGRICULTURAL LIMESTONE FURNISHES OPPORTUNITY.

Producers of agricultural limestone are spending much money and effort in promoting the use of this material for improvement of the soil, and no better source of distribution is to be found than building material dealers who handle crushed stone, sand and gravel. They are in a position to store this material and to make deliveries at a minimum cost. The same delivery equipment which furnishes contractors and consumers with their materials can be used in delivering to the farmer, where he is not in a position to call for his pulverized limestone.

The agricultural limestone industry is in its infancy, but each year shows an improvement over preceding years. The farmers are beginning to realize that soil must be sweetened and the agricultural departments of the various states are working most enthusiastically with the granges and other farmers' societies in a study of soil conditions and the need of a soil sweetener. Wherever pulverized limestone has been used for this purpose it has been found beneficial and an increased amount has been used the second year, as the farmer is always anxious to extend his experiments over his entire tract of land when they prove successful on test piece.

While the industry is young and before any set standard of selling and delivering the material is adopted through the process of custom, an opportunity is presented building material dealers of the country to add to their profitable lines a product which will not only amount to large tonnage but should be the means of extending their bank accounts.

Farmers are builders, and no retailer should lose an opportunity to sell this class of people a product which is so closely allied to their present line. By discussing the use of limestone upon the soil retailers will form a closer degree of friendship with their farm trade and, as a result, will be in a better position to advise them on the nature of buildings which should be erected upon the farm, and the materials of which they should be constructed. Farmers are open to conviction, and farms in all parts of the country are sorely in need of more and better buildings. Here is an opportunity for dealers to do a little promotion work and at the same time to receive a handsome profit for doing it.

Get in touch with the manufacturers of agricultural limestone who are in a position to ship into your territory and satisfy yourself as to the advisability of putting in this lime.

WAGON SHED PROTECTS EQUIPMENT.

One of the most deplorable sights to be seen in the yard of a retail building material dealer consists of numerous wagons, motor trucks and other equipment left in the open while not in actual use. They are at the mercy of the elements and, naturally, in the course of time deterioration sets in. Consequently, the years of service expected of such equipment are not received.

Most of the larger concerns, and all of the up-to-date firms, have realized the practical necessity of building sheds for the protection of their vehicles when not in use. The cost of these sheds is a mere bagatelle and will be paid for in very short order by the saving on equipment. They are usually constructed just wide enough to accommodate the longest wagon or truck and long enough to pro-

SMILE!

At a recent meeting of Local District Committee No. 4, Wisconsin Division, N. B. S. A., held at Sheboygan, Wis., when called upon for a talk, Miss E. H. Roth, secretary-treasurer and manager of the Sheboygan Lime Works, read a piece of verse by Arthur Chamberlain entitled "Smile." She stated that in her opinion the advice given by Mr. Chamberlain could well be followed by building material dealers, whose experiences in dealing with contractors, consumers and competitors are quite diversified. The applause which greeted the reading of the poem substantiated Miss Roth's remarks.

Let's all smile!

When everything goes crooked
And seems inclined to rile
Don't kick nor fuss nor figit;
Just you smile.

It's hard to learn the lesson
But learn it if you'd win;
When people tease and pester
Just you grin.

But when some one tries to "do" you
By taking more than half,
Be patient, firm and pleasant;
Just you laugh.

But if you find you're stuffy,
Sometimes, of course, you will,
And cannot smile, nor grin, nor laugh,
Just keep still.

vide for such additional equipment as may be purchased within a year or two after they are constructed. If the roof protrudes far enough to entirely protect the contents from the rain and heat of the noonday sun, this building may be built with but three walls, leaving one of the longer sides supported with as few pillars as possible. In this manner wagons and trucks may be driven in with the least amount of effort and time.

Where the winters are severe and snow or coldness is liable to affect the machinery of the trucks, it is advisable to build large doors, hung upon hangers, which may be rolled back and forth as desired. As these are not necessary during the summer months it is advisable to construct them so that they can be easily detached.

EMPTY BAG "PICK-UPS."

Quite frequently a teamster in making deliveries is told to pick up empty cement sacks on the return trip. Almost as frequently the teamster returns and upon inquiry states that he forgot to pick up the sacks. This is partially the fault of the firms which give only verbal instructions.

If order slips with the words "Pick Up" printed in large bold type were furnished the driver, there would be no chance for an excuse, as he would have no occasion to refer to his memory being in error. The order blanks would naturally contain the name and address of the party to call upon and the approximate number of bags to be picked up.

The contract for the construction of the second section of a 1,500-foot revetment wall was awarded by the park board of Milwaukee to the Edward E. Gillen Co. of that city.

TOMKINS BROTHERS HOLD ANNUAL OUTING.

On Saturday of last week the sales and office force of Tomkins Brothers, Newark, N. J., wholesale dealers in building materials, held their annual outing at Crystal Lake on Orange Mountain. Twenty men attended, being taken to the lake in the company's automobiles and motor trucks. After having lunch at the Crystal Lake Hotel, two base ball teams were organized. The married men and single men opposed each other as usual, and it happened that the two were evenly divided as to numbers, but not as to proficiency in the game. The single men climbed on the merry-go-round and stayed there for six innings. The score piled up by the singles was so great that the married man who wrote this account has forgotten the exact number. However, the married men claim that there is one kind of ball which they can stop with more proficiency, and they are ready to defend their title in this field against any team of their unhampered brothers.

Aside from the ball game (?) field sports were held, consisting of a sack race, three-legged race and potato race.

After dinner at the hotel in the evening, a "handsome solid plaster loving cup was presented to the captain of the winning ball team, and large, gorgeous plaster medals were pinned on the winners of the field events.

The following is a list of Tomkins Brothers' officials and employees who attended the outing: Messrs. Tomkins, Wire, Williams, Macauley, Ernstberger, James, Holland, Jacobsen, Schubert, Hagen, Moore, Byles, Lanzara, Schuler, Crozier, Harper, Salkeld, Lackner, McCloskey, Carswell, Palmer.

MEERSCHAUM AS BUILDING MATERIAL.

Even the most aesthetically inclined of our American millionaires would hardly consider the luxury of living in a place built of meerschaum as within the range of their fortunes, yet there are many unpretentious houses of this material in the Spanish town of Vallecas, near Madrid, where a coarse variety of this substance is to be found. On the other hand the Moroccans, just across the Straits of Gibraltar, find that still another variety of meerschaum lathers freely and they use it, perhaps sparingly, as a substitute for soap.

The chips and sawdust of the meerschaum pipe factories make an excellent cleaning powder for removing stains from costly fabrics. An inferior pipe is also made from these scraps, the fragments being bound together with some solution and then molded into blocks.

Meerschaum is found in Greece and in Hrubschitz, Moravia, as well as in Asia Minor, and to a limited extent in Pennsylvania, South Carolina and in the upper Gila valley, near Silver Lake, S. M.—Exchange.

NEW FIRM AT COLUMBIA CITY, IND.

David A. Welter, city engineer of Columbia City, Ind., and former county surveyor of Whitley county, is now engaged in the business of selling lime, cement blocks, plaster, cement, vitrified tile, flue lining, fire brick, fire clay, ornamental and other kinds of brick and other building and construction supplies.



CABOT LODGE, WHERE WISCONSIN DEALERS ENJOYED TWO-DAY OUTING.

Wisconsin Outing a Complete Success

With the days good and warm and the nights cool and comfortable, approximately 100 building material dealers and their families spent a most delightful two-day outing in the midst of the woods at a point known as Cabot Lodge, just north of Sturgeon Bay, Wis., on Saturday and Sunday, July 15 and 16. Cabot Lodge is located at a point where Sturgeon Bay and Green Bay meet and as part of the land fronts on Green Bay and with a second strip of the triangular-shaped stretch on Sturgeon Bay, it may well be said divides the two bodies of water. Bathing, fishing, and other water sports are ideal at this spot and were much enjoyed by those in attendance at the outing.

The affair was held under the auspices of the Northeastern Wisconsin Building Material Dealers, but every one recognized H. R. Isherwood of the Sawyer Lumber Co., Sawyer, Wis., as the man at the wheel. When it comes to managing affairs of this kind, Mr. Isherwood's ability and willingness is second to none. From early Saturday morning until the last guest left on Monday, his time and everything else that he owns, including his "Oldsmobile," was at their disposal.

As the guests arrived at Sturgeon Bay they were met at the station by Mr. Isherwood, who conveyed them to the water front, from which spot they crossed Sturgeon Bay as guests of the Commercial Club.

At the Lodge every consideration was given to the comfort and convenience of the dealers and

their families and practically the entire hotel and its cottages were placed at their disposal. The tennis courts, the row boats, the dancing pavilion, the lobby and the grounds all belonged to the building material dealers for the two-day period. On Saturday evening a splendid banquet was enjoyed in the dining room of the lodge, and coming with an appetite that the woods produce, a delicious array of palatable foods was quickly and appreciatively devoured.

After the repast H. C. Schofield, president of the Sturgeon Bay Commercial Club, acted as toastmaster, while a half dozen short speeches were made by some of the guests. In pleasing words, Mr. Schofield welcomed the visitors and called upon Mayor N. C. Garland for a further message of welcome. This was extended in the most cordial manner.

Adolph Pfund, secretary of the Wisconsin Retail Lumbermen's Association, complimented Door county on its points of interest and attractiveness, and for the loyal spirit of welcome extended to the guests.

Secretary L. F. Desmond, of the National Builders' Supply Association, stated that he was glad he had taken the trip for he knew that every minute of the stay would be pleasant.

G. A. Olsen, of ROCK PRODUCTS AND BUILDING MATERIALS, lauded Door county and Sturgeon Bay on the aggressiveness of its business men and when he referred to the fact that he had heard a good deal

about Door county cherries, but had never tasted any, fifteen different men from as many different parts of the dining room came rushing toward him, each with a bowl of freshly picked cherries, demonstrating on the spot the interest taken by these men in Door county and the hospitable treatment accorded visitors.

Stephen Balliet of Appleton spoke of the good time he already had enjoyed and suggested that the appreciation of the guests to Mr. Isherwood for his work be shown by a rising vote. Immediately every man and woman in the room arose and cries of "speech," "speech," caused Toastmaster Schofield to call upon Mr. Isherwood.

Mr. Isherwood very modestly stated that he, speaking for himself and the men of Sawyer and Sturgeon Bay, were "glad to have you with us." He protested at making a speech, stating that one of the special features of the banquet was the absence of speechmaking.

At the close of Mr. Isherwood's talk, Mr. Scho-



H. R. ISHERWOOD TELLING MRS. M. B. HELMER THE HISTORY OF STURGEON BAY.

field expressed his pleasure at being able to preside at the banquet and extended an invitation to make Cabot Lodge and Sturgeon Bay headquarters of association activities in the state of Wisconsin.

About an hour later found all of the guests in the ball room of the hotel tripping the light fantastic to pleasing music furnished by a Sturgeon Bay orchestra. For those who did not dance other forms of amusement were available.

Early Sunday morning found a number of the more aggressive on the bay angling for fish. While few large fish were caught, an exceptional appetite was produced and if it hadn't been for the well-kept larder of the Cabots, it is hard telling whether the late risers would have had anything to eat that morning.

At ten o'clock a party of fifty guests left the lodge for Sturgeon Bay, whence they motored to the town of Ephriam, thirty-one miles distant, for dinner. Enroute they passed through the 700-acre cherry orchard of the Co-operative Cherry Farm and through the towns of Egg Harbor and Fish Creek.

After dinner at Ephriam the guests enjoyed an

(Continued on page 49.)



A BOATLOAD OF EARLY ARRIVALS. IN THE PARTY ARE MR. AND MRS. M. B. HELMER, CATHERINE HELMER, OF FOND DU LAC; MR. AND MRS. BREITMAN, OF GREEN BAY; MR. AND MRS. NOYES, OF CHICAGO; MR. AND MRS. JENSEN AND SONS; MISS E. H. ROTH, OF SHEBOYAN; MISS M. GARLAND, OF STURGEON BAY; ADOLPH PFUND, OF MILWAUKEE; A. A. STADE, OF MILWAUKEE; G. A. OLSEN, OF CHICAGO, AND D. X. BRANDS, OF OCONTO.



GENERAL OFFICE HELMER MILLING CO., FOND DU LAC, WIS.



MR. HELMER'S PRIVATE OFFICE. NOTE ARTISTIC FIREPLACE.

Helmer Opens New Quarters at Fond du Lac

With the blaring of trumpets, large bouquets of flowers, the presentation of valuable souvenirs and the awarding of prizes to lucky participants in contests, the new quarters of the Helmer Milling Co., at Fond du Lac, Wis., were opened on Saturday, July 1.

The name of Helmer in connection with the building material, seed, feed, flour and grain industry of Wisconsin is well known. Since the organization of the Helmer company in the late '60's the firm has been an active factor in the Badger state and each succeeding year has added to its prosperity. O. L. Helmer, nearly fifty years ago, started the business and was succeeded about twenty years later by M. B. Helmer, the present owner, who has been at the head of the business the past twenty-eight years.

The new offices and sales rooms are located in a

two-story structure on West Second street and are adjacent to the recently constructed concrete storage bins for stone, gravel and sand. A weighing scale of large dimensions joins the two structures.

The offices and salesrooms display the various materials handled in an attractive manner. The firm has a complete line of high grade face brick and the sixteen varieties are displayed in panels in the general office. In the private office of Mr. Helmer is a fireplace, built of Alliance rug brick in a tasty and artistic manner.

The sand and stone bins are twelve in number and have a capacity of thirty-five carloads. They are constructed along the most modern lines and with the object in view of storing and handling materials in the most economical and time-saving manner. Hoppers at the bottom of the bins permit

the loading of two-yard wagons in less than two minutes' time. The same idea of economy and speed permeates the entire operation of the Helmer Milling Co. and assures contractors and consumers a delivery of materials in the shortest possible period of time and always when wanted.

Mr. Helmer has demonstrated his desire to run the business in the most up-to-date manner by reading the leading journals pertaining to the various lines of his business, attending the meetings of men in kindred lines of endeavor and associating himself at all times with men who are in a position to give him information relative to the best methods to follow when any new venture or a change is deemed advisable. He is an active factor in the building material fraternity of Wisconsin and is well liked by his competitors as well as by his customers. When Local District Committee No. 3, Wisconsin division of the National Builders' Supply Association was organized Mr. Helmer was unanimously elected chairman.

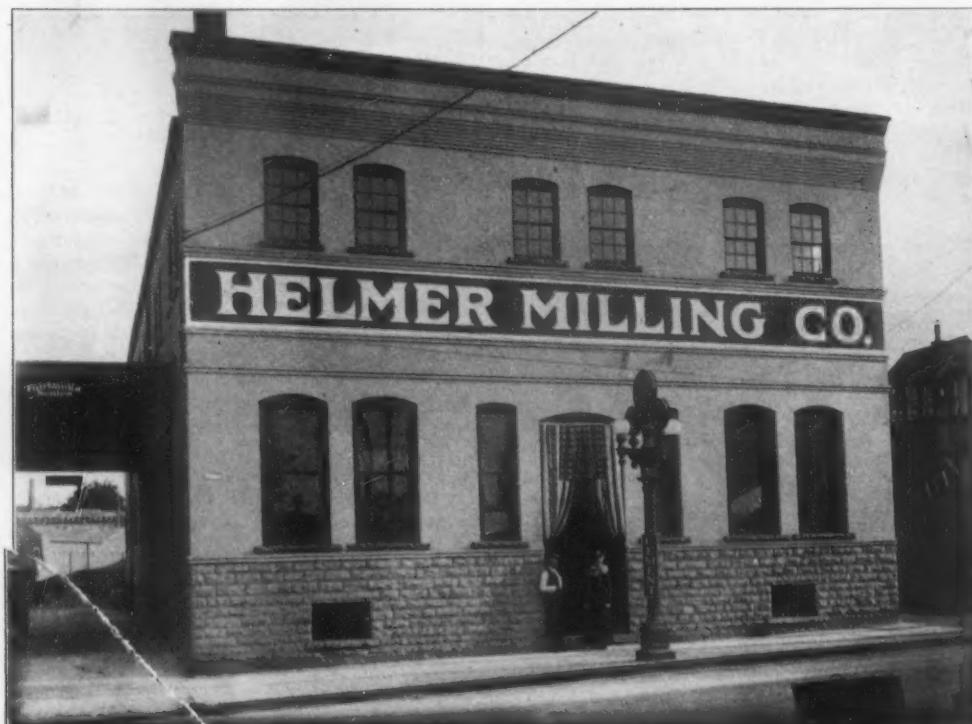
Mrs. Helmer and Miss Catherine, his daughter, have taken an active interest in the business of their husband and father, being of the conviction that what is of vital interest to him should be so familiar to them that when topics of conversation arise in which the condition of business talked of they will be in a position to enjoy the conversation, counsel with him, encourage him or sympathize with him as the occasion may require.

The keen competition and low margins of profit existing in the building material industry today compel an active interest in the welfare of an institution such as Mr. Helmer has built.

LOS ANGELES BUILDING ORDINANCE DELAYED.

The ordinance providing for the licensing and bonding of contractors and material men in Los Angeles has met with some opposition, and has been withdrawn for reconsideration. An effort will be made to frame an ordinance which will be approved by the material men, brick men and others interested in building and it is possible that the licensing and bonding idea will be modified or eliminated.

A good deal of agitation is now going on in San Francisco and in some of the suburban cities for safer building construction for lodging houses, hotels, theaters, etc. The outlook is for some additional building restrictions calling for a larger use of concrete and brick for the construction of such buildings.

GENERAL OFFICES AND SALES HEADQUARTERS OF HELMER MILLING CO.
MR. AND MRS. M. B. HELMER IN DOORWAY.

Building Materials in the Movies.

Things in motion pictures are not always what they appear to be. Indeed, if you could be allowed a peep behind the scenes and see the uses to which building materials are put, you would surely be amazed.

As you cannot obtain the necessary permission to visit a motion picture studio in person, suppose you take an imaginary trip with me through one of the largest film producing plants in this country. You can then be posted on the subject in which you are deeply interested.

In the first workroom we run up against some newly completed heads and busts which are soon to be employed in an important historical production. The construction man was first given rough sketches of the desired models two days before. He immediately went ahead and modelled the subjects out of clay. But as they stood they would not photograph well, so he touched them up with paint in order that they would survive the glare of the arc lamps.

In another studio shop we find expert alabaster workers busy on some pieces of statuary. We first are attracted by a Roman statue, for we notice that the framework comprises strips of wood held together by wires. We are told that this will be covered by a mixture of wrapped burlap, cheesecloth and plaster of paris. Out of these materials the construction man will fashion a piece of art, effective enough for the purpose.

Passing to the third room, we are much interested in willing hands working on suits of armor. We expect to hear the clank of metal, but when we pick up a suit, we discover it to be remarkably light and noiseless. Why? Because papier mache forms the body of the garment, which is done over to look the real article by skilful clay modeling.

For a change we walk around the studio yard. In one corner is what at first appears to be a regular log cabin, but when we inspect it at close range we find it made of thin strips of wood with the bark left on. Each plank is securely held together by a thin layer of plaster. Then we go round the back, only to be again disillusioned. There is nothing but the front, which is supported by a scaffold and braces.

Better still, however, in the middle of the yard, we observe some native stone huts in the process of construction. This promises to prove interesting, so we beat it.

We are in New York, but the tropical foliage makes us feel we are in the wilds of Africa. We watch the first section of one of the huts erected. The studio hand places the plank of wood on the ground and brings forward a quantity of cement. He takes particular pains to point out to us that the cement is hard and in pieces of many sizes. He places chunks down on the section at irregular distances. This operation paves the way for burlap, which is used in such a way as to bind together all the lumps of cement.

Why do the motion picture producers play the game of make believe to such an extent? There is a reason—and that is the cost of production. Years ago the producers used to hire all the properties they needed locally, but the plan proved so expensive and uncertain that they decided to manufacture what they required themselves.

After all, what do their deceptive practices matter? The producers are business men, and if their customers—the fans—cannot detect the difference, they have given satisfaction.

In the past the producers did endeavor to impress the fans with their wizardry. One stunt in particular which puzzled them was to see a bricklayer enjoy his pipe in front of a pile of bricks, which, one by one, jumped on to the wall and placed themselves in position, thus the wall was gradually built. The effect was put over by filming the bricklayer by the wall, but on the opposite side, out of range of the camera, a man pulled down the already

erected wall and shied each brick on the pile by the side of the other man. By filming it the opposite way, the last picture appeared first, and so spectators were deceived.

The fans soon grew tired of the trick type of film and wanted lifelike productions. So the producers gave them, but kept the game of make believe to themselves, as I have proven to you by the "trip."

MILWAUKEE DEALERS PLAN OUTING.

Members of the Milwaukee Building Material Dealers' Exchange, which comprises every dealer in the city of Milwaukee, Wis., are going to enjoy an annual outing on Saturday, July 29.

A considerable amount of money and time has been spent in promoting this event and the retailers feel that it is going to be a real get-together meeting. The event will be in the form of a picnic and will include not only the officials of the firms, but members of the office and sales forces, their wives and children, and such as are not married are asked to bring their sweethearts.

In order to make this affair a complete success the Exchange has used good judgment in selecting W. H. Pipkorn, president of the W. H. Pipkorn Co., as chairman of the arrangements committee. Upon inquiry Mr. Pipkorn says:

"We are going to do this to the best of our ability and make it a red-letter day for all who attend. We are going so far as to notify the trade that there will be no business done on that day. This is for two reasons. First, we want everyone to be with us. Second, we want the trade to know

that we are a big family and that they had better sit up and take notice, that conditions are better than they were a few years ago when we used to try and shoot each other.

OHIO DEALERS AWAIT ANNUAL OUTING.

Members of the Ohio Builders' Supply Association are anxiously awaiting Thursday, July 27, when they will gather at Breakers' Hotel, Cedar Point, Ohio, for their annual midsummer outing and meeting. The outing is staged to last over Friday and Saturday, July 28 and 29. Many of those attending will take advantage of the Sunday following and make it a four-day week-end outing.

Practically the entire three days will be spent in getting better acquainted and in other diversified social pleasures, but a short business session will be held at which time action will be taken on the establishment of local district organizations throughout the state. This topic has been much discussed of late in the state of Ohio and will undoubtedly be realized at the forthcoming meeting.

Reservations already made with Secretary F. H. Kinney at Cincinnati indicate that a large number of retailers, manufacturer's representatives and their ladies will be in attendance at Cedar Point.

NEW CLAY TILE FIRM FOR TEXAS.

The United States Indestructible Tile Manufacturing Co., Eagle Pass, Tex., capital, \$100,000; tile and other clay products; incorporators are W. F. Foust, C. W. Holly and F. C. Schearer.



NEWLY CONSTRUCTED SAND, GRAVEL AND STONE BINS OF HELMER MILLING CO. CAPACITY, THIRTY-FIVE CARLOADS.

Association News

Important Communications and Notices from Officials of the Various Organizations and Records of Recent Happenings

James H. Allen, President, National Builders' Supply Association, Lincoln, Neb.
 Charles M. Kelly, President, New England Builders' Supply Association, Providence, R. I.
 Frank H. Genung, President, Mason Material Dealers' Association of New Jersey, Newark, N. J.
 W. O. Holst, President, Ohio Builders' Supply Association, Toledo, O.
 B. L. Grove, President, Del-Mar-Col Builders' Material Dealers' Association, Washington, D. C.
 H. E. Shadle, President, West Virginia Lumber and Builders' Supply Dealers' Association.

DETROIT DISTRICT ORGANIZED.

Field Secretary H. S. Gaines reports the establishment of a local district committee consisting of the counties of St. Claire, Macomb, Wayne, Oakland, Washtenaw, Wayne and Monroe, which is Local District Committee No. 1 of the Michigan Division, of the National Builders' Supply Association, with headquarters in Detroit.

The first meeting was held Friday evening, July 14, at a dinner at the Statler Hotel, Detroit. C. N. Ray, president of the United Fuel & Supply Co., Detroit, was elected chairman of the district and E. J. Tisdell of Parker Bros. Co. was elected secretary. Representatives from all the cement and plaster companies operating in the district were present, the meeting being presided over by Mr. Ray. The purposes of the association were explained to the dealers present by Mr. Gaines who was followed by Mr. Ray with a most interesting talk upon the value of organization and what it could do for the dealer, if properly handled.

The movement was heartily endorsed by the manufacturers and enthusiasm that was created resulted in every dealer present joining the association. Following is the list:

McDonald Coal & Brick Co., Detroit.
 C. P. Steinheiser Co., Detroit.
 Cadillac Bldrs' Supply Co., Detroit.
 H. H. Dickinson Co., Detroit.
 Michigan Bldrs' Supply Co., Detroit.
 Parker Bros. Co., Detroit.
 Mutual Bldrs' Supply Co., Detroit.
 Bldrs' & Pavers' Supply Co., Detroit.
 J. Calvert's Sons, Detroit.
 United Fuel & Supply Co., Detroit.
 Grand River Lbr. & Coal Co., Redford.
 Redford Lumber Co., Redford.
 Hillard & Reiser, Wayne.
 C. W. Upton, Rochester.
 Bradley & Chubb, Romeo.
 Labadie Bros., Ford.
 A. R. Cole & Co., Ann Arbor.
 Farmington Lbr. & Coal Co., Farmington.
 City Concrete & Coal Co., Detroit.
 Eberts Bros. Co., Wyandotte.
 R. M. Meyer, River Range.
 A. & W. Cooper, Detroit.

Arrangements were made for another meeting to be held at the Cadillac Hotel, Detroit, Tuesday evening, July 25. It is fully expected there will be between fifty and sixty dealers present.

ENTHUSIASM HIGH AT MICHIGAN MEETINGS.

Three enthusiastic N. B. S. A. meetings were held in Michigan last week under the direction of Field Secretary Gaines. These were well attended by representative dealers of the districts who did not refrain from asking questions relative to association work.

On Monday, July 10, the dealers in the Battle Creek district met at dinner at the Post Tavern, Battle Creek, at which time the following named dealers were taken into membership:

Gibbs & Saunders, Albion.
 Albion Lumber Co., Albion.
 P. J. Buell, Union City.
 Wood & Woodruff, Athens.
 Bellevue Lbr. & Coal Co., Bellevue.
 Colborn Fulton Lbr. Co., Charlotte.
 Miller & Hamilton, Charlotte.
 Legg Lumber Co., Coldwater.

The members of the Jackson district met at dinner at the Otsego Hotel, Jackson, on Tuesday, July 11. This district was recently organized and evi-

dence of the fact that interest in the N. B. S. A. has been rapidly developing was presented in the discussion of the various topics brought up.

On Wednesday, July 12, members of the Kalamazoo district sat down to dinner at the Park American Hotel, Kalamazoo. The following named firms were taken into membership at this meeting:

W. E. Boyd, Comstock.
 Lindsley & Tourize, Dowagiac.
 Constantine Lumber Co., Constantine.

Mr. Gaines gave interesting talks at all of these meetings on cost accounting and the practical results that come from the right kind of organization work.

INDIANA OUTING AUGUST FIFTH.

The outing of building material dealers of Indiana, which was announced for July 22, has been postponed until Aug. 5. The date previously announced allowed too short a time for the necessary preparations. The outing will be held at Culver, on Lake Maxinkuckee, Indiana, an ideal place for an outing of this kind, where bathing and fishing facilities are ideal.

Secretary Desmond of the National Builders' Supply Association, will visit Culver on July 23 for the purpose of completing arrangements for the outing. He plans to have as a feature an outdoor dinner.

The intention behind the movement is to give the retailers of the state an opportunity to become better acquainted. Social features will be prominent and business will be almost entirely tabooed, a short session only being held immediately after the dinner.

A great deal of interest has been taken in the state of Indiana because of its successful work in the district plan or organization adopted by the N. B. S. A. It was in Indiana where this work was first attempted. The enthusiastic manner in which the dealers of the state took to the plan caused the officers of the association to extend their activities to other states. No state meeting of the Indiana dealers has ever been held under the new plan, but quite frequently members of the various districts have expressed themselves in favor of getting together with their fellow dealers in different parts of the state for the purpose of becoming better acquainted and to receive a stronger incentive for doing business in a twentieth century manner, which always results from brushing elbows with men in a kindred line of activity.

It behoves every dealer in the state of Indiana, whether a member of the association or not, to be present at this outing. Take your mind off the activities of business for a day and make arrangements to arrive at Culver early Saturday morning, August 5. There will be a committee to meet you at the train, and from that time until your train departs you will be in the hands of your friends.

Manufacturers of building materials shipping into the state of Indiana are urged to notify their representatives to be present at this outing and to take an active part as members of the entertainment

committee. This committee will consist of every man, whether dealer or manufacturer, who attends the meeting.

This outing is not necessarily a stag affair. Bring the ladies with you. Wives, sweethearts and daughters will enjoy the outing.

O. B. S. A. OUTING JULY 27-29.

Cincinnati, O., July 20.

Fellow Members—Every indication points this year to a large attendance of the dealers at our summer outing at Cedar Point, Breakers' Hotel, on Thursday, Friday and Saturday, July 27, 28, and 29. While the main purpose of this is social and to get better acquainted as dealers, also with the representatives of the manufacturers, we have arranged for a business meeting, at which will be taken up matters of general interest to our members and the establishment of locals throughout the state and better organizing our territory to protect ourselves against unfair competition.

It is necessary for every dealer who appreciates the benefits of good competition to be with us at this time, to become more familiar with the work, to do his share of the work and to add his influence toward the objects we have in view.

The committee in charge have made arrangements for a boat ride for the ladies of the party on the afternoon of Friday, July 28. Kindly see that the ladies of the party are registered in the secretary's office.

The fish dinner will be Friday noon at Breakers' Hotel.

Kindly make reservations at once, either direct or through the secretary, notifying the secretary that there are ladies in the party and also reservations as to the fish dinner.

Believing you appreciate the benefits of organization and hoping to have your presence at this outing, we remain Yours truly,

OHIO BUILDERS' SUPPLY ASSN.,
 W. O. Holst, President.
 F. H. Kinney, Secretary.

TWIN CITY DEALERS' ANNUAL PICNIC.

The second annual picnic and joyous get-together party of the Twin City Building Material Exchange was held at Snail Lake, Minn., Sunday, July 9. Every dealer in St. Paul and Minneapolis attended the outing, with two exceptions, caused by illness in the families.

The picnic was a great success, according to Ivan Ringstad, president and manager of the Midway Lime & Cement Co., St. Paul. "It would surprise the dealers of many towns to know that competitors can actually set out and hobnob on a holiday and do business the next, but we do it here and it is working out splendidly," said Mr. Ringstad. In addition to the retailers a number of office men and most of the manufacturers' representatives who live in the Twin Cities were present.

An advance program had been printed by the picnic committee and was so arranged that nothing was lacking from nine o'clock in the morning, when the dealers began to arrive at Como Park until five p. m., the hour of departure. An interesting baseball game, with St. Paul dealers pitted against those of Minneapolis, was one of the features. Due to the inability of the various players to agree with the umpire on the final score, it is impossible to state which side won. There was plenty of singing, story telling and other features which go to make an outing of this kind a complete success. The manufacturers' representatives had previously promised to refrain from talking "shop" and, for the purpose of harmony, no references were made by dealers to competitors relative to the various jobs which may have been "put over" in the recent past.

NEWS of the TRADE

NUMEROUS STRIKES HAVE CRIPPLED BUSINESS.

New York, July 21.—According to the information obtained by ROCK PRODUCTS AND BUILDING MATERIALS from the Bureau of Labor Statistics covering the first six months of 1916 there were more strikes and lockouts in the United States in the six months ending June 1, 1916, than in all of 1915. Between Dec. 1, 1915, and June 1 of this year there were 1,432 labor disputes, while during 1915 the number was 1,405. In May alone there were 396 strikes started, most of which were in the building and metal trades. Fourth in the list were freight handlers and longshoremen, which interfered with the handling of material for New York City jobs. This explains why the dealers have not been buying brick, cement, lime and other commodities freely within the first half of this year.

SIX MONTHS SHOW INCREASE.

New York, July 21.—Plan filings in New York building for the six months just closed show twenty per cent increase in prospective expenditures, with a decrease of four per cent in permits. This includes all of New England. In other words, for the entire country in 1916 there were 138,200 permits granted in 141 cities valued at \$470,801,820. This is an increase in permits of 2.8% and in value 27.6%.

For New England with twenty-two cities reporting there were 8,252 permits granted with a value of \$33,209,645.

BIG INCREASE IN BUILDING OPERATIONS.

Instead of slowing down more nearly to normal, the building operations for the month of June show the most decided gains recorded during the past half year. The official reports of building permits issued in 103 principal cities of the country, as received by the American Contractor, Chicago, total \$91,768,080, as compared with \$63,890,866 for June, 1915. This is an increase of forty-four per cent. The comparative gain for May was thirty-two per cent; for April, sixteen per cent; for March, eighteen per cent; for February, twenty per cent, and for January, thirty-five per cent. June, therefore, indicates that building activity, instead of shrinking, is speeding up.

This condition is most gratifying when it is remembered that a considerable amount of construction work is held in abeyance, pending a reduction in the cost of iron and steel, and perhaps some other forms of material. There has been a softening of prices for structural material, however, in recent weeks and the date when this withheld business may be commenced may not be far in the future. Not only is the volume of business largely in excess of that of a year ago, but the number of building permits shows an increase, namely, 26,593, compared with 24,488 for June, 1915.

Of the 103 cities included in the list below, sixty-seven show gains and thirty-six losses. New York, in its five boroughs, makes the substantial gain of 117 per cent; Chicago scores a forty-five per cent improvement, and Philadelphia one of thirty-three per cent. There are many other notable gains.

A summary of the monthly building statistics for the first six months of the year reaches the total of

\$484,786,616, as compared with \$381,264,854 for the first six months of 1915, an increase of twenty-seven per cent.

The details of the June statement are as follows:

City.	June, 1916		June, 1915		Percent
	No. of buildings	Estimated cost	No. of buildings	Estimated cost	
Akron, Ohio	415	\$1,322,465	129	\$865,250	51
Albany, N. Y.	100	1,000,000	100	1,000,000	0
Allentown, Pa.	44	165,730	34	151,700	9
Atlanta, Ga.	254	383,770	294	284,240	34
Baltimore, Md.	200	281,000	129	157,000	75
Berkeley, Cal.	49	102,584	55	25,734	22
Birmingham, Ala.	112	254,475	160	214,600	18
Boston, Mass. (and vicinity)	877	1,770,500	125	1,250,000	42
Bridgeton, N. J.	477	5,624,066	643	5,225,000	8
Brownsville, Mass.	78	254,965	87	43,267	200
Castro, Conn.	89	326,945	72	158,670	148
Chattanooga, Tenn.	201	281,000	141	150,000	44
Chicago, Ill.	1,028	11,060,700	857	7,613,500	45
Cincinnati, Ohio	200	2,000,000	170	1,700,000	18
Cleveland, Ohio	1,294	3,742,570	1,481	2,378,510	5
Colorado Springs, Colo.	200	200,000	91	100,000	100
Columbus, Ohio	200	200,000	125	125,000	55
Dallas, Tex.	182	311,440	112	143,185	119
Davenport, Ia.	61	115,720	49	90,000	22
Des Moines, Ia.	100	200,000	100	170,000	18
Detroit, Mich.	68	264,230	77	166,200	55
Duluth, Minn.	1,717	4,941,100	844	2,948,200	35
East Orange, N. J.	100	100,000	80	80,000	25
Elizabeth, N. J.	69	251,444	48	166,614	31
Erie, Pa.	149	251,475	124	188,250	32
Ft. Wayne, Ind.	78	328,875	69	172,380	89
Ft. Worth, Tex.	78	328,875	69	172,380	89
Green Bay, Wis.	127	460,000	70	210,000	111
Harrisburg, Pa.	38	329,155	47	221,960	43
Hartford, Conn.	121	816,700	120	625,520	20
Hartford, Conn. (Residence)	120	110,000	100	100,000	10
Hoboken, N. J.	10	16,480	28	66,140	74
Holyoke, Mass.	70	146,700	25	100,000	37
Huntington, W. Va.	100	100,000	114,000	104	
Indianapolis, Ind.	648	773,792	540	520,220	33
Jacksonville, Fla.	82	218,397	42	109,650	111
Kansas City, Mo.	125	317,277	125	220,000	35
Kansas City, Mo.	318	974,425	394	785,340	26
Lincoln, Neb.	14	164,825	81	127,200	28
Long Beach, Cal.	600	1,062,250	580	450,000	130
Louisville, Ky.	230	260,145	218	322,420	19
Manchester, N. H.	127	177,700	91	116,917	22
Memphis, Tenn.	170	250,000	120	150,000	40
Minneapolis, Minn.	697	1,658,820	765	1,264,500	32
Montgomery, N. Y.	57	54,240	32	32,000	70
New Bedford, Mass.	92	1,000,000	100	700,000	40
New Haven, Conn.	81	310,200	90	261,150	5
New York City	114	275,580	100	261,020	41
New York City	2,657	26,16,916	5,494	13,265,744	117
Borough of Manhattan	449	18,322,110	4,900	4,922,100	317
Borough of Bronx	142	1,420,000	1,200	1,200,000	0
Borough of Brooklyn	498	2,822,278	380	1,204,041	90
Borough of Queens	479	1,546,141	472	1,744,075	11
Borough of Richmond, N. Y.	278	422,195	265	277,715	427
Oakland, Calif.	70	1,147,115	47	58,227	15
Oklahoma City, Okla.	43	62,060	100	70,000	10
Omaha, Neb.	100	62,060	100	70,000	10
Orange, Calif.	397	163,944	139	163,830	37
Passaic, N. J.	44	163,530	100	163,540	100
Paterson, N. J.	100	111,124	100	111,124	0
Peoria, Ill.	116	116,628	47	175,600	37
Philadelphia, Pa.	1,750	8,147,115	1,760	5,872,000	35
Pittsburgh, Pa.	120	262,612	100	110,000	120
Portland, Ore.	230	983,215	391	660,000	114
Quincy, Mass.	118	269,125	85	130,612	100
Reading, Pa.	100	90,000	71	125,000	34
Sacramento, Calif.	280	642,943	294	369,535	200
Sacramento, Calif. (Residence)	94	96	115,540	321	
Salt Lake City, Utah	120	212,000	100	100,000	120
San Antonio, Tex.	180	189,450	100	96,330	11
San Diego, Cal.	139	166,725	187	126,678	19
San Francisco, Cal.	100	1,000,000	100	1,000,000	0
San Francisco, Cal. (Residence)	94	77,000	...	52,270	200
Savannah, Ga.	58	97,060	65	115,540	16
Schenectady, N. Y.	112	112,000	100	112,000	0
Seattle, Wash.	98	238,998	112	243,491	1
Seattle, Wash.	551	447,260	687	521,045	166
Spokane, Wash.	60	244,000	40	160,000	50
Spokane, Wash.	66	48,731	40	91,477	27
Spokane, Wash.	125	138,416	68	240,250	62
Springfield, Ill.	100	100,000	100	100,000	0
St. Joseph, Mo.	100	800,318	107	453,530	59
St. Louis, Mo.	93	25,210	60	74,946	111
St. Paul, Minn.	720	1,212,000	792	1,000,000	217
Stockton, Cal.	67	1,396,975	311	1,609,940	9
Superior, Wis.	67	66,960	45	70,611	14
Tampa, Fla.	200	264,617	107	56,820	154
Tampa, Fla.	87	67,250	153	340,300	75
Tampa, Fla.	94	114,000	64	250,000	155
Toronto, Ont.	500	500,194	278	763,845	155
Topeka, Kans.	64	97,485	95	38,045	4
Trenton, N. J.	60	200,000	100	400,000	100
Troy, N. Y.	63	55,783	68	33,475	100
Utica, N. Y.	63	129,720	74	272,400	68
Washington, D. C.	494	1,040,000	500	1,300,000	21
Wilkes-Barre, Pa.	118	117,281	66	58,111	100
Wilmington, Del.	118	231,875	66	166,294	100
Worcester, Mass.	200	600,000	241	124,000	100
Youngstown, Ohio	139	270,655	113	433,000	35
Total	26,593	\$91,786,616	34,486	\$63,890,866	35

LOUISVILLE MARKET BRISK.

Louisville, Ky., July 18.—Concrete work in and around Louisville, on jobs already under way, is going forward steadily, contractors generally pouring. Work on the new Speed buildings, being done by the National Concrete Construction Co., has passed the second floor. The work on the canal is being interfered with by the high water which has also delayed operations at the government dam being built at West Point. The Speed company is supplying cement for the canal construction work and the Kosmos company for the work on the dam at West Point.

Building operations have been somewhat slow in developing. The records of the city building inspector's office for June showed a falling off, although there are numerous large projects waiting for later in the season before they are begun.

CHICAGO BUILDING CONTINUES ACTIVE.

Activity in the Chicago building market continues to improve, practically every day a permit being issued for one or more structures running into the hundreds of thousands of dollars. The month of June shows an increase of \$3,437,200 in projected operations over June, 1915. For last month there was a total of 1,028 building permits issued at an estimated cost of \$11,050,700. The same month last year shows a total of 857 buildings at an estimated cost of \$7,613,500. According to these figures, there was a gain of forty-five per cent in the estimated cost of buildings for which permits were issued.

Another pleasing feature of the Chicago market is the fact that all building operations of large size are not confined to the loop district. Outlying business property has been in good demand for the past month and a number of handsome permits have been issued for these sites. Building plans which will call for the expenditure of approximately \$1,500,000 are being mentioned in connection with the sale of a piece of property at Sheffield and Cornelia avenue, about five miles north of the loop district.

On July 15, Chicago's new recreation spot, known as the Municipal Pier, was formally opened and Chicagoans and visitors were given an opportunity to witness this \$4,000,000 structure which projects half a mile out into Lake Michigan, in the construction of which, immense quantities of lime, brick, cement and concrete aggregates were used.

Now that the last legal obstacle for the widening of Twelfth street has been removed, actual construction on this \$8,000,000 project will be started this summer. The cost including awards to property owners and the building of bridges and viaducts and other expenses will be about \$5,000,000. An additional \$3,000,000 will be expended for rehabilitation, including the laying of new pavement and sidewalks. The work will be carried out under the direction of the board of local improvements, of which Michael J. Flaherty is president.

Plans are under way for the erection of a high-grade fireproof commercial building at the northeast corner of Wabash avenue and Randolph street to cost \$300,000. The site has been leased by A. Starr Best, Inc., for a period of ninety-nine years.

PROSPERITY IN EASTERN PENNSYLVANIA.

Philadelphia, July 19.—Dealers in building materials throughout the entire eastern section of the state of Pennsylvania report experiencing a most satisfactory volume of business during the past few weeks. The general prosperous condition of practically every line of industry is largely accountable for the demand for building materials, as many establishments, in order to take care of a largely increased business, have been forced to erect additions to their plants. Many large dwelling operations are under way and there is every indication that the building trade in this vicinity will continue to experience the most favorable conditions for many months to come. Such cities as Reading, Bethlehem, Allentown, Chester, Easton and Scranton are subject to a wave of prosperity second to none in the history of the country and labor is at a premium, large employment bureaus having been established in order to help the industrial plants procure a full roster.

EASTERN TRADE CONDITIONS.

Newark, N. J., July 18.—Affairs in the business world are about the same as they were a month ago. Business in the building trades is unusually good, considering the high prices for most commodities, according to Tompkins Bros., wholesalers and retailers of mason's materials at Newark and New York City. Material prices, especially masons' materials, are stationary and little change is likely before late summer or fall. An exception to the rule is the steel market, which is undergoing readjustment, with a tendency toward lower prices. A few other basic materials also are quoted at lower levels, such as lumber, paints, oils, ready roofing, builders' hardware, plumbers' supplies, and common brick. The past few weeks have seen an increase in the number of plan filings and in contracts for construction or materials. Architects are busier than they have been for several years with plans being drawn, figured or filed.

Because of another car shortage in the eastern and middle western states, as well as the strikes of freight handlers on the railroads and along the docks in New York, the freight congestion is likely to bob up again to worry shippers. Even without another freight congestion, manufacturers are being hard pushed to fill orders and get shipments under way. Dealers who stocked up early in the spring are now able to fill orders promptly, while those who held off for lower prices are having trouble in obtaining some materials which they want in a hurry.

A considerable number of large projects are going ahead, particularly in the metropolitan districts, which will call for structural steel, as well as quantities of cement, brick and other materials. The plans for these projects have been ready for some time, but the operators seem to have been waiting for an expected sudden drop in the steel market. In this they have been disappointed, for while there was a decline of \$1.35 a ton in the average price of steel during June, it is still \$59.72 as against \$31.20 a year ago.

In view of the present somewhat easier tone of the steel market, the reason for the manufacturers' advance in the price of metal lath on July 1 has been misunderstood in some quarters. But it should be remembered that the manufacturers had to contract for their next six months' supply several months ago when steel was at its highest. They held off the advance for nearly a year, even though they had to pay more for their raw material, but the last advance by the steel mills forced the lath makers to raise their prices in order to realize even a moderate return on their capital invested.

The wholesale price of common brick, alongside the docks in New York, has dropped to \$7.50 per M, and the manufacturers predict that they will hold up around this price all summer on account of their high costs of operation. However, labor strikes in New York and several days of bad building weather combined to allow the brick makers to accumulate a supply which was temporarily greater than the demand, causing a somewhat easier tone to the market. Raritans are firmer, selling from \$7.50 to \$7.75, wholesale. The demand in New Jersey is good, particularly in the larger industrial centers, on account of the unusual amount of factory construction. It is expected that prices will hold around these figures for some time, because of the high cost of manufacture.

For almost a year there has been an unusual demand for fire brick for use in boiler settings and furnaces in new plants and for renewals in old plants, all of which are running full blast. Fire brick is a staple article and a very necessary one in all power plants, and must be renewed when burned out. Many dealers do not recognize the importance of this material and overlook the opportunity to solicit the business of power plants in their territories, thus forcing those who require it to buy out of town. The demand has been so great that

the fire brick makers have not been able to make deliveries inside of several weeks after receiving orders. This demand is likely to continue for months to come, and deliveries will be even more delayed if the car shortage now threatening grows worse. Many large users of fire brick realize the necessity of having a supply on hand and are now placing their orders for delivery during 1917.

The wall board business during the past four or five months has shown a tendency for easier sale and a greater demand than in any period since the inception of the wall board industry.

Rumors to the effect that a new price list on pipe and flue linings would be issued by the manufacturers do not seem to materialize. It appears that the manufacturers went so far as to print a new price list, but for some good reason, known only to themselves, did not officially issue it; and it now begins to look as though action on this matter has been indefinitely postponed. Prices seem to be well maintained, with shipments slowing down on account of the difficulty the manufacturers are having in obtaining transportation for their daily requirements.

BOSTON MARKET BOOMING.

Boston, Mass., July 18.—Building operations show small signs of slowing down to normal as the thick of the season approaches. Machinery purveyors have their hands full supplying contractors; dealers in cement, masons materials, lime plaster and finishing all report good business. Softening rates in structural material has had the effect of seeing some business commenced that had been withheld.

Building permits for the first half of July, in greater Boston, reported by the F. W. Dodge Co., give 233 new projects and the valuation of the same \$2,343,000. The total construction figures for New England continue an advance of \$5,000,000 over the banner year of 1912.

Work has been begun on the annex, 67x90, to the Boston public library, in Copley square. George Baker Long, of Worcester, is the contractor and the plans are by Joseph McGinniss. The construction is steel, reinforced concrete, face brick and granite trimmings. One reason given for substituting gray face brick for granite, the material of the renowned original architectural pile, is that the cost of the proposed structure will not exceed the appropriation.

Harold L. Bond reports steady deliveries of contractors' machinery and supplies. The firm says the labor shortage is a disturbing factor in the building industry, otherwise all lines of demand are expected to continue heavy.

MANY APARTMENTS FOR ST. LOUIS.

St. Louis, Mo., July 18.—Some color is given to building activities here, which for some time have been rather disappointing. The proposed work consists principally of small apartment houses, which are so popular here, and some real estate men and contractors are of the opinion that this year's work will eclipse any record made during the last several years.

The structures, for which permits were issued yesterday, will aggregate approximately \$50,000 in cost. Upwards of thirty permits were taken out, the most important of these being issued to the Trade Realty Co. for the construction of two three-story apartment buildings at a cost of \$27,000. They will be under the supervision of H. L. Weir.

R. A. and G. B. Bullock have purchased the northwest corner of Julian and Hamilton avenues and will erect on the site a handsome group of apartment buildings. The projected apartments are to represent the extreme modern in buildings of this character and will form a most attractive improvement for that part of the city.

CONDITIONS IN THE WEST.

Kansas City, Mo., July 19.—Manufacturers and jobbers of building materials in the west are not worrying about the consumption of their goods this year. Big construction work is going steadily up. Many new projects, public and private, are in the formation stage or ready for letting; high prices have not proved a deterrent factor and car shortage has never materialized.

The earlier summer outlook, with a labor cloud on the horizon, developed into a small squall. There has been considerable rocking of the boat as a consequence. Kansas City, for instance, had a strike of large enough proportions to tie up practically every project of importance in the city for about six weeks. The fact that western troubles have been settled generally with some concessions made to labor, indicates the desire of contractors to keep work going. There is too much to do to get all tied up.

The retail situation is necessarily a little slow in rural districts on account of crop conditions which keep the farmers on the fields. As a general rule, retail stocks are pretty full; there is a fair amount of inquiry and a disposition to make purchases. The fact that heavy crop movement will call for a large number of cars is a great factor in getting stocks in shape before crops get started.

Prices are strong. Lumber has been weak for some time but shows a tendency to tone up. Mills are running at capacity. Cement prices assuredly will not drop this year. All manufacturers are rushing production to keep up with the demand.

Weather conditions are ideal. The fall will undoubtedly see great prosperity with a world of building material used in the central west.

CONDITIONS FINE IN TEXAS.

Austin, Tex., July 18.—Conditions in Texas could hardly be more encouraging for the inauguration of an era of almost unprecedented activity in the various lines of the building trades than they are at present. Crop prospects are splendid. This applies specially to cotton, which is the principal money crop. The acreage of this staple is about ten per cent larger than of any previous year and if prices remain high, as is now indicated, an enormous revenue will be obtained from the crop this fall. The forage crops are good and farming operations generally are about as promising and bright as they could be. While there is a slackening of building activities in the larger cities, due largely to the hot weather period, an unusual amount of work of this character is going on in the smaller towns throughout the state. In Western Texas, where agricultural development has made big strides during the past few years, town building is going on on a larger scale than ever before. Concrete as a building material is coming more and more into general use in the smaller towns, particularly in the plains country of West Texas, where lumber and other wood materials are high in price. Silos of concrete construction are being built in large numbers. In the different counties much is being done in the way of building concrete bridges and culverts. The adoption of this building material for many uses upon the farm is becoming widespread.

BUILDING OPERATIONS CONTINUE ACTIVE.

Salem, Mass., July 18.—Building operations continue active in the burned area and demand for materials strong. A number of street widenings are under way, and 13,000 feet of concrete base, block street paving is in sight. It has just been determined to continue the state boulevard and fill in both ends of the Beverly bridge, a \$200,000 operation just starting. The city has increased its cement order from 2,000 to 8,000 barrels.

Ropes Bros. are furnishing Atlas Portland cement to Mack Bros., on the Salem hospital job.



The Great Traymore Hotel at Atlantic City Is Built of Edison Cement

This structure is remarkable not alone for its size but the speed of its construction. Edison service was an important factor in hastening the work.

Every day sees in process of construction some great monument to Edison Portland Cement—a towering skyscraper, an immense reinforced concrete factory, a dam, subway, pier or other great engineering project. They are giant testimonials to the strength and imperishability of EDISON CEMENT.

Edison Cement is the product of the greatest manufacturing skill, its uniformity assured by the most accurate weighing, its quality by constant testing. Edison himself devised many of the methods and invented much of the machinery used in its manufacture. His name is assurance of its dependability.

If you are not yet an Edison dealer, write for prices on Edison Cement

Edison Portland Cement Co.
Boston Philadelphia
New York

The Cost of Changing Cable

Every time you install a new rope, you are spending time and labor, and your work stops. Did you ever figure out just what this time, labor and delay actually cost in dollars and cents?

Whatever the cost is, it must be added to the original price of the rope in order to determine correctly the rope's value.



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is made to give maximum service, rather than to sell for a minimum price.

Because of its durability it saves the expense of frequent changes, and consequently it is more economical in the end than a "cheap" rope.

Why not make the saving?

59 years in business

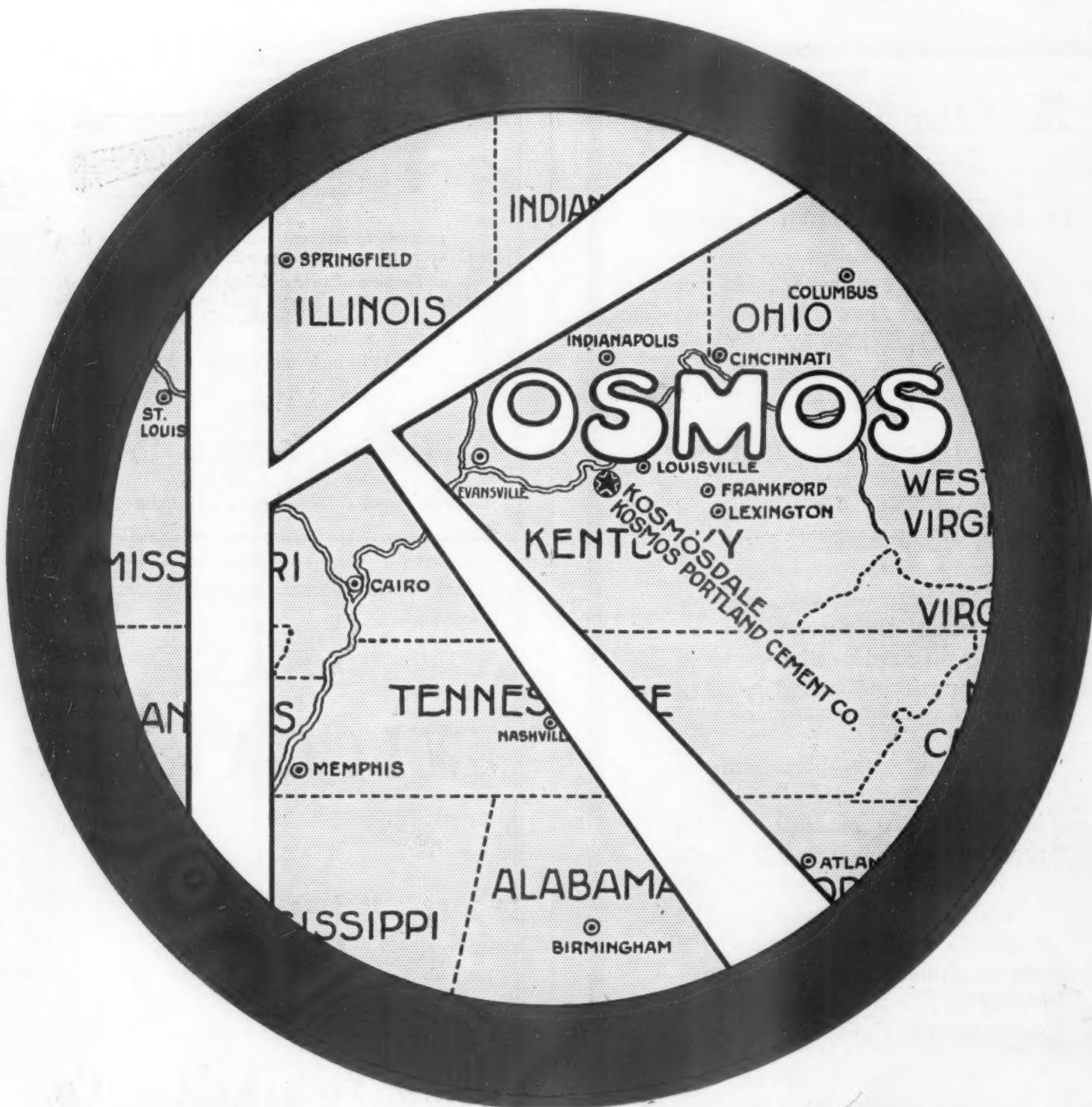
A. Leschen & Sons Rope Co.
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FACTORIES:
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A FIRST CLASS WAREHOUSE BRAND Equal to All Requirements

KOSMOS PORTLAND CEMENT CO. MAIN OFFICE AND PLANT - KOSMOSDALE, KY.
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Granite Saves Contractors from Loss

Officials from Criticism and gives one hundred cents of value for every dollar expended.

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Main Office: Lumber Exchange, Chicago, Illinois

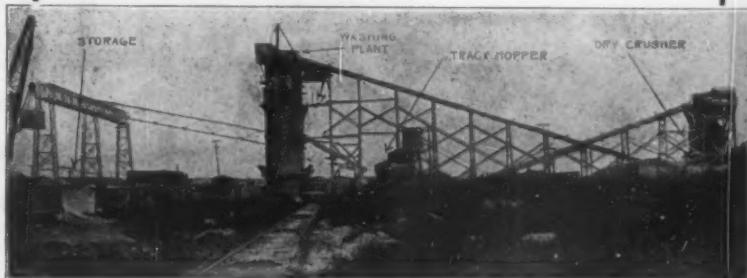
What Do You Do with Your Surplus Stone?

Do you force the sale at a sacrifice in order to keep your plant running?

Or do you suspend production until you can profitably sell the sizes not in immediate demand?

Or is your supply and demand so nicely balanced that you have no surplus? (We have heard of no such plant as yet.)

Or are you following the modern method of piling the surplus and holding it until the market swings round and demands your slow sizes at your own price?

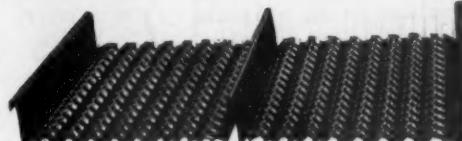


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5-in. Hy-Rib Lath used as self-furring lath and in partitions, ceilings, etc., for stud spacings 24 in. to 36 in.

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Hy-Rib in four depths from $\frac{3}{8}$ to $1\frac{1}{2}$ in. Each in various gauges. Rib Lath, a most economical lath in three types and various gauges. Diamond Lath in two types and various gauges.

Kahn Pressed Steel Studs include channels from $\frac{3}{8}$ to 2 in. in size, studs with prongs from 2 to 12 in. and hollow studs in various sizes.

Steel Corner Beads for the protection of plastered corners, in four types. Metal Base Screeds for use between cement base and plaster are supplied in three types.

Inserts for use in concrete slabs, beams or columns, for attaching Fixtures, Shaft Hangers, etc., are furnished in three types.

Dealers increase sales by handling a line that is known for its high quality and the service back of it.



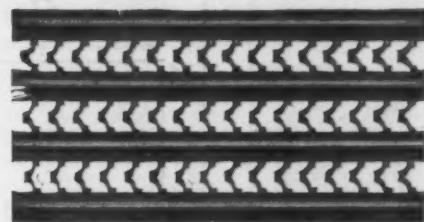
Trussed Concrete Steel Co.
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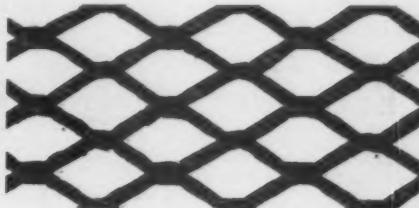
REPRESENTATIVES IN PRINCIPAL CITIES



Kahn pressed
steel channel
studs, 3, 4,
5, 6 inches;
and 2 inches
width out
turned flange



Beaded Plate Rib Lath permits two-coat work instead of three.



Diamond lath in two types and various gauges.

THE PLIES CAN'T SEPARATE
(THEY'RE DOUBLE STITCHED)

THAT'S ONE REASON WHY

REXALL DOUBLE-STITCHED BELTING

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SPECIALISTS IN
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CONDITIONS IN WESTERN CANADA.

Winnipeg, Man., July 15.—Inquiries among the supply men in the prairie provinces, particularly in the country districts, bring forth the information that the trade during the past two weeks has been a very decided improvement on the preceding months and that it is far ahead of a corresponding period of 1915. The bumper crop of 1915 has helped business in the building supply trade considerably and the tendency ever since the year opened has been in the direction of a gradual improvement in the business conditions of almost every city in Western Canada. There is a decidedly optimistic tone among the retailers that conditions will continue to improve until the winter sets in. Payments are coming in in an unprecedented manner. Retail stocks are at a very low ebb and retailers are being forced to buy in many centers. So great has been the demand for cement in the west that the Canada Cement Co. has been obliged to reopen its western plant at Exshaw, Alta.

The number of buildings erected at Winnipeg during June was 148, valued at \$570,000, compared with 138, valued at \$450,000 last year. For the first six months of 1916 the permits at Winnipeg totaled \$1,706,300, against \$1,090,300 in 1915. The most important permits issued during June were for a reinforced concrete bank building costing \$600,000, and for a church building, \$50,000.

Contracts to the value of \$23,000 have been awarded for the erection of reinforced concrete culverts and bridges in several Manitoba municipalities by the good roads commissioner.

Winnipeg master carpenters and union men are at loggerheads over the wage question. At a recent meeting the Winnipeg carpenters declined to accept a two years' wages and hours proposal submitted by the Builders' Exchange. The present union rate for carpenters is fifty-five cents an hour and the offer made by the Builders' Exchange for a two years' period was fifty cents an hour for qualified carpenters and thirty-five cents an hour for helpers or form men.

The contract for the construction of a \$500,000 concrete elevator at Port Arthur, Ont., has been let to the Barnett-McQueen Co.

The big \$1,000,000 terminal for the C. N. P. railway at Vancouver, B. C., has been let to a Winnipeg firm, Carter-Halls, Aldinger, Ltd.

Tenders have been called for the completion of the Manitoba Parliament buildings. Bids are to be in by August 21. It is anticipated that the buildings will cost \$2,000,000 to complete. Tenders may be presented for the work in bulk or by special contracts which are designated in the schedule of quantities furnished by the expert quantity surveyor from London, Eng., who has had charge of the work of preparing the bill of quantities for the completion of the building.

SAN FRANCISCO BUILDING INCREASES.

Figures compiled by the San Francisco Board of Public Works show an increase in the building operations for this city for the fiscal year which closed June 30, over that of the year previous of \$3,789,000. Building permits issued during the year 1915-1916 called for a total expenditure of \$18,018,000, while for the year previous the total cost of the buildings for which permits were issued amounted to \$14,226,000, in which was included a large amount of exposition building. During the year which closed June 30 a total of 7,558 building permits were issued and for the year previous the permits numbered 6,387.

Of the permits issued during the last year eighteen were for Class A buildings costing \$1,280,000, nine were for Class B buildings with an estimated cost of \$761,000, 178 were for Class C buildings with an estimated cost of \$3,376,620, and 1,947 were for frame buildings estimated to cost \$7,041,000.

Permits for alterations to the number of 4,371 were issued, the estimated cost of these being \$1,811,000. Three large California state buildings were erected at a cost of \$848,000 and state buildings were erected along the water front at a cost of \$748,000. The municipality put up twenty-two buildings at a cost of \$2,138,000.

During the month of June building throughout the city held up well notwithstanding the vacation season. Building operations in the city ran well above \$2,000,000 for the month, a gain of more than \$400,000 over the month preceding and of nearly \$1,250,000 over the month of June, 1915. Other cities in California did not show up so well, Los Angeles registering a drop of about thirty per cent from the average of recent months. Portland, Ore., permits ran up to nearly \$1,000,000, far above the monthly averages for several years past.

NASHVILLE MARKET FLOURISHING.

Nashville, Tenn., July 17.—The present conditions of building affairs in Nashville is best shown by the fact that material dealers are not working out new plans of securing business, as they have practically all the trade that they can successfully take care of. Building permits for the first half of the year showed a total of \$1,954,542.35 which is very close to the total for all of 1915. From present indications, the total for the year will be nearly double that of last year.

The high prices of materials and labor have caused a number of owners to hold off until the cost of building drops, but in the greater number of cases owners are going ahead with their building plans despite this condition, as the buildings are in greater demand than the amount of money that could be saved. This is good proof that the present prosperity of the country is not due entirely to munition manufacture, as Nashville is well off the line of the manufacture of war materials.

There are a number of large buildings under construction at the present time, notable among these being the addition to the high school, at a cost of \$200,000; the Forth and First National bank building, at \$250,000; the Hyde's Ferry bridge; the Cumberland Telephone Co.'s building, at \$200,000; Doctors' Office building, St. Thomas hospital, Galloway Memorial hospital, and other structures. The Board of Commissioners recently ordered a resumption of street paving work, which had been stopped, by court proceedings and this will bring in orders for materials for concrete foundations and for surfaces for about twenty miles of streets. The holding up of this work had had a big effect on building material situation, as it meant the stopping of some big orders. There has also been a resumption of sidewalk work throughout the city, this having been held up, also, in large part by the investigation of the city's affairs following extensive municipal troubles.

Plans have been prepared by the city engineer for a concrete viaduct to cost \$127,000 which will be built early next year when money will be appropriated. A number of other big works are scheduled for the same time. There has been vigorous activity in residence work, resulting in large sales of plaster, brick and similar materials.

The general labor situation has been good. A committee from the brick manufacturers' and contractors' branch of the Builders' Exchange recently met with a committee from the brick masons' union and arranged a new wage scale resulting in a slight increase. The supply of common labor is much better in the south than in the north at present and, although the increase in business has led to a small increase in daily wages, it is comparatively easy to get men at reasonable wages.

The Lawrence Portland Cement Co., Siegfried, Pa., has increased its capital stock from \$1,200,000 to \$2,000,000.

WISCONSIN DEALERS BUSY.

Milwaukee, Wis., July 19.—There has been no let-up in building operations in this territory. In fact, the past two weeks have developed several large jobs which will help materially in further increasing the business of building material supply houses and manufacturers for the year. The weather has been ideal for construction work and a large part of street and road work proposed for this year is now under way. The market is firm without any indication of a drop. This condition is looked upon as a necessity as the manufacturers are compelled to pay more for labor and other items. Retailers are satisfied to pay a fair price as long as they can be sure of getting the stocks within a reasonable time. While the car shortage in this section has not been serious, there has been a decided and acute shortage of labor. Manufacturers are short of help, retailers cannot get sufficient common labor and the contractors have been handicapped.

Building operations that are now under way and on which deliveries are being made include many small structures. Among the larger ones are the seven stores and twenty-one apartment building at Twenty-seventh and Wells streets, which will be 147x55 feet, with sixteen-inch brick walls and sixteen-inch concrete basement, costing nearly \$90,000; an elaborate apartment building on Lake Drive with eighteen apartments, three stories, fifteen-inch concrete basement, 35x130 feet, with thirteen-inch brick walls, will cost \$110,000; at Martin and Astor streets, a four-story apartment, with twenty-inch concrete basement, 122x80 feet, with seventeen- and twelve-inch brick walls, will cost \$80,000, and a similar structure at an adjoining site, 50x98 feet, will cost \$50,000. All these contracts have been awarded within the past few days, the Rauf Co., Patton building, having secured the concrete work on all of them, and Riesen & Wilke the mason in the last two mentioned.

A large prospective job which is being watched with interest is the new \$100,000 high school building which has recently been authorized by the city of Platteville, Wis. The board of education has been authorized to proceed with plans. At Shawano, Wis., the board of education recently opened bids for the erection of a new high school to cost in the vicinity of \$80,000. The bids ran way over this amount so it was decided to award the contract to the lowest bidder, the Immel Construction Co., Fond du Lac, Wis., on the percentage basis. This practice has been noticed frequently of late. A good many buildings were planned or contemplated after rough sketches and estimates of several months ago before the prices of building materials went up. Now that the work is materializing it is found that the estimated cost is below the actual figures submitted by contractors. Realizing the present conditions of the market it is often decided upon to go ahead on the percentage basis.

The city of Park Falls, Wis., is taking bids this week for the construction of a new high school building. Brick construction will be used. This job is estimated at \$50,000. The Plymouth Hospital Association, Plymouth, Wis., will erect a new hospital and plans are ready for bidders. Brick and tile construction is planned, and the building will cost about \$25,000.

Street paving work is again showing improvements. In Milwaukee contracts were awarded a few days ago for several miles of pavement, including concrete, vitrified block, asphalt and macadam. The Western Improvement Co., Racine, Wis., has secured a \$12,000 asphaltic concrete job at Burlington, Wis. At West Allis, Wis., bids will be opened August 14 for a permanent concrete pavement eighteen and thirty feet wide on Beloit road from the east to the south city limits. Vitrified paving block will be used on the main business street at Stoughton, Wis.

CONCRETE

Concrete Tennis Courts

BY H. COLIN CAMPBELL.

Although some persons may be disposed to regard a concrete tennis court as a rather novel use for concrete, this notion is easily dispelled by mentioning that as early as 1901 there was a concrete tennis court in use in Cleveland, O. This court has, however, since been destroyed to make way for building improvements; but there is a concrete tennis court at New Orleans now in its ninth year of service, while many tennis or other clubs have built and used concrete tennis courts for a number of years past. There are such courts at Omena, Ottawa Beach, White Lake, Grand Rapids, Cadillac and Holland, Mich., also at Duluth, Minn.; Hollidaysburg, Pa.; Albany, N. Y.; Chicago, Ill., and courts are now being built in Pittsburgh and several other places.

While some players might be inclined to advance a number of objections to the concrete tennis court, these fancied objections have been proven not worthy of consideration by those who have experienced the many advantages of play on the concrete court, which is in reality nothing more nor less than another adaptation of the concrete pavement.

One of the best known of the private courts is at Lakewood Farm, Holland, Mich. This is an eighty-two by thirty-eight-foot court, having a very slight surface pitch from the middle toward both sides to insure quick drainage after rainfall, while the pavement is cut into slabs every four feet in its length and every four feet, nine inches of its width. Slabs are five and one-half inches thick, three and one-half inches of which is base, while the remainder is the two-inch cement mortar top course which was troweled smooth and when mixed, tinted with black coloring matter such as is used to color mortar employed in pointing stone masonry walls. This was for the purpose of reducing glare under

bright sun and also made the tennis balls show up better against the darkened surface.

George F. Getz, owner of Lakewood Farm, which is one of the show places of Michigan, says that all who have played on this court have proved that the fancied objections of the inexperienced have been overruled. He has remarked on more than one occasion that it is no uncommon thing for his guests to be playing tennis in January and February on this court, something which ordinarily would not be possible with soil or turf courts owing to weather conditions usual during these months. Court lines were first marked out by snapping a chalk line, then painting stripes with aluminum bronze paint which was afterward painted over with white lead and oil. The object in using the aluminum bronze paint first was to prevent the white paint from "creeping" on the smooth concrete surface. On some other concrete courts, court lines have been permanently fixed by an inlay of white Portland cement mortar.

No greater advantage can be claimed for the properly constructed concrete tennis court than freedom from the maintenance necessary to keep soil and grass courts in suitable condition for play. There are times when, regardless of the best maintenance, courts other than concrete cannot be used on account of weather conditions. The concrete court is always ready and is particularly efficient where necessity compels that a court be located in a relatively low spot, since with concrete the playing surface will be dry regardless of the nature of the surrounding soil.

In planning to lay out a tennis court a location should be chosen that will afford sufficient area to pave outside or beyond actual court lines, thus giving ample room for the players. Foundation requirements should be carefully studied and met in

accordance with the conditions of the soil and location involved. Suitable provision must be made for foundation drainage, this being necessary principally to prevent water from being retained beneath the pavement and the consequent heaving that would result from freezing and subsequent expansion. Drains should be placed to take care of surface water running off the court and good practice now advocates that the surface be sloped at a rate not to exceed two inches in sixty feet, from side line to side line.

Concrete pavement practice in general considers careful preparation of the subgrade, which involves digging out all soft spots and filling them with gravel or clean cinders, which should be thoroughly compacted. Following this the whole foundation area should be thoroughly rolled to uniform firmness. The subgrade for a concrete tennis court should be prepared in the same manner. On top of this there may be placed a subbase of well compacted gravel containing a relatively small quantity of sand or a layer of well compacted cinders, provided the location is such that trouble may be expected from water otherwise likely to be retained under the pavement. On soil in which drainage is free, such a subbase will not be necessary.

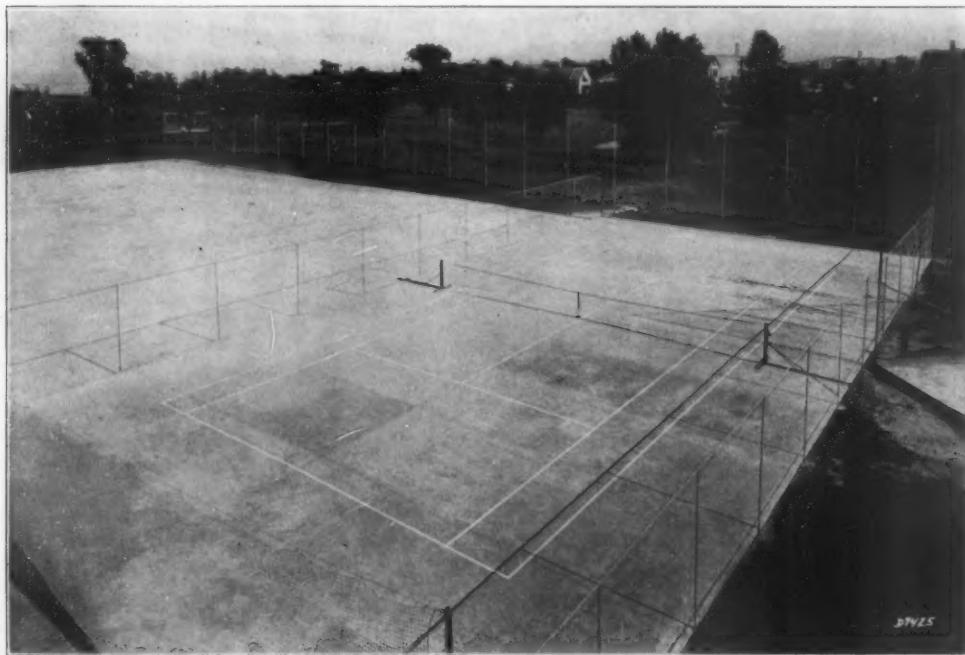
When a gravel or cinder subbase is required the site of the intended foundation must be excavated sufficiently so that the surface of the finished pavement will lie at proper level in relation to the surroundings. It is a good plan, however, to grade the ground up to the court so that the court surface will be somewhat above the surrounding ground level. This contributes to better drainage of the foundation.

Good practice recommends that the thickness of the concrete pavement shall be not less than four and one-half inches. Of this, three and one-half inches is base and one inch a top, or wearing course. The base should be of concrete mixed in the proportions of one sack of Portland cement to not more than two and one-half cubic feet of clean sand, well graded from the finest permissible particles to those that will just pass a one-quarter-inch mesh screen, with the coarser particles predominating, to not more than four cubic feet of clean, well graded pebbles or broken stone ranging in size from one-quarter to one and one-quarter inches. In no case should the volume of sand used be less than one-half the volume of the pebbles or broken stone.

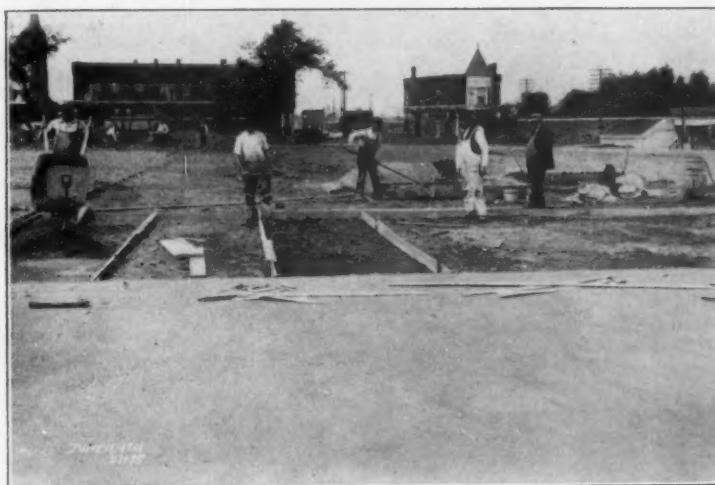
The individual slabs should be reinforced with steel rods or wire fabric, the latter placed lengthwise of the court sections. It should be placed upon and slightly pressed into the concrete of the base immediately after the base is placed. Reinforcing must not cross joints as slabs must be independent of each other and the reinforcing also should be not less than one inch from the finished surface of the court. The top, or wearing course, should consist of a cement-sand mortar mixed in the proportions of one sack of Portland cement to not more than two cubic feet of sand, meeting the requirements already specified. It is very necessary that the wearing course shall be placed immediately after mixing and before the concrete in the base shall have had opportunity to harden. Not more than forty-five minutes must be allowed to elapse between placing concrete for the base and that for the wearing course.

In mixing the concrete, sufficient water must be used for the base mixture so that free moisture will flush readily to the surface when compacting the concrete by slight tamping. The mortar for the top, or surface, should not be mixed any wetter than necessary to make it possible to strike off the surface with a saw-like motion of the strikeboard. After this, the surface should be floated and finished smooth first with a wood float and then gone over lightly with a steel trowel.

One of the most vital requirements leading to success in pavement construction of which the concrete tennis court is a type, is that the concrete



CONCRETE TENNIS COURT AT SOUTH SHORE COUNTRY CLUB, CHICAGO, POLISHED FOR DANCE FLOOR, 55 BY 112 FEET.



CHICAGO TENNIS CLUB'S COURTS IN COURSE OF CONSTRUCTION.



TWO COMPLETED TENNIS COURTS AT CHICAGO TENNIS CLUB'S GROUNDS.

shall be properly protected after placing to insure uniform hardenings. This means that as soon as possible to apply a moist earth or sand covering without marring the concrete surface, such a covering should be thrown over the concrete and should be kept wet for at least ten days.

Built after proper specifications, by careful workmen, the concrete court requires no attention for maintenance other than may be necessary to once yearly paint court lines, unless these are inlaid by means of a white Portland cement mortar, as already suggested.

To overcome any fancied objection that some may raise as to the possibility of the finished surface causing excessive light reflection during bright, sunny days, the mortar mixture used for the top course may be tinted by adding lampblack in the proportions of one pound to one sack of cement. Attempts have been made to secure a green tint to a concrete court surface by using a green coloring matter in the same manner. So far, no satisfactory green coloring matter that is permanent has been found. Most of the green pigments tend to fade more readily than do some other colors. Generally speaking, the mineral pigments are practically permanent. Brown and reddish tints may be secured by using a suitable natural colored silica sand or some one of the garnet sands in the top course.

Within the past two or three months a number of tennis courts have been built in various sections of the country. Grand Haven, Mich.; Pittsburgh, Pa., Duluth, Minn., Chicago and Rockford, Ill., and Albany, N. Y., all have tennis courts that are this season's work. The concrete tennis courts built at the South Shore Country Club, Chicago, Ill., were finished with rotary floor finishing machines such as are used in terrazzo or mosaic floor construction, the intention being that on occasions during the summer these courts would be used for open-air dances. It is also the intention to use them as a parking place for automobiles when not being put to their other intended uses. The concrete courts at the Chicago Tennis Club were built for championship tournaments. They are not completely finished at the time the views shown herewith were taken and it is the intention to build a retaining wall around the lot and a curb around the courts so that the court surface may be flooded during freezing weather and the area thus transformed into a pond for skating.

The writer is indebted to the Portland Cement Association, 111 West Washington Street, Chicago, for the greater portion of the information contained in this article. The association mentioned has prepared excellent specifications governing the construction of concrete tennis courts and is a reliable source of information on this subject as well as upon others relating to the various uses of concrete.

GOOD WORK ON VICTORIA BREAKWATER.

Victoria, B. C., July 15.—The work on the Victoria breakwater and piers is proceeding most satisfactorily, according to the returns made for this big concrete undertaking. In reporting progress made during the month of May, it was stated that it constituted a record over any other month since the work began. The work accomplished during the month of June did not beat that record, but it equaled it.

The total work done on the breakwater contract by Sir John Jackson (Canada), Ltd., to June 30, 1916, includes the placing of 242,000 tons of core stone, 914,000 tons of rubble mound, 129,000 tons of granite blocks and ninety-four concrete blocks, representing 32,000 cubic yards of concrete.

During the month of June eight concrete blocks were constructed. These average twenty-five feet in length by twenty-one feet in depth. Four more of these blocks are to be built, together with the large head block at the outer end of the breakwater.

The contract undertaken by Grant Smith & Co., and McDonnell, Ltd., is proceeding rapidly. The total work done up to June 30, 1916, on the piers included the placing of 372,300 tons of rubble mound, 5,500 cubic yards of top dressing on rubble mound. The cribs sunk include one seventy-seven-foot, twenty-seven eighty-foot and eight ninety-foot. The total concrete in the cribs amounts to 46,000 cubic yards, total steel in cribs 3,200 tons and sand and gravel filling in cribs 19,200 cubic yards and back fill between cribs 88,000 cubic yards.

The cribs actually sunk during the month of June number eight. Seventeen cribs remain to be sunk, and of these fifteen remain to be constructed, two being on the way at the crib works.

CONCRETE COURSE CREATES INTEREST.

As a result of the publicity given the recent short course in concrete for manual training and vocational teachers by the Portland Cement Association at Chicago, requests for information on how courses in concrete may be installed in the public schools have been received by A. J. R. Curtis, director of the Extension Division of the Association, from 808 teachers who did not attend the course.

"The idea of teaching boys how to use concrete in the construction of flower pots, boxes, urns and other garden furniture is taking like wildfire," explains Mr. Curtis. "The boys seem to consider it a pleasure to mix cement and aggregates and to mold them into objects of beauty for the adornment of schoolrooms and grounds. In some of the schools where concrete courses are now part of the curriculum advanced pupils have arrived at the stage where they are making concrete sidewalks

and floors and using this material in other practical ways."

This feature is only one of the numerous ways in which the Portland Cement Association, under the guidance of Manager J. P. Beck, is promoting the use of Portland cement.

TEMPERATURE CHANGES IN MASS CONCRETE.

That the insulation against heat and cold is a function efficiently performed by concrete work, is shown by the results of tests recently conducted at the Arrowrock Dam on the Boise Project in Idaho. The results of these tests are set forth in a paper entitled "Temperature Changes in Mass Concrete," presented to the American Society of Civil Engineers by Charles H. Paul, construction engineer, and A. B. Mayhew, principal engineering assistant, on the Arrowrock Dam.

At a distance of a foot or more from its face, mass concrete shows relatively small daily or seasonal variation in temperature, even under the greatest variation in climatic conditions.

While the effect of chemical action in the concrete—which is still going on and may not be fully understood—may throw possible doubt on any conclusions reached at this stage, and may necessitate their modification, yet the facts seem to warrant the following conclusions:

1. Large bodies of concrete deposited rapidly during the summer season develop a temperature of from 90 to 95 degrees within a period of about 30 days, and maintain nearly that temperature for several months.

2. In the case of concrete 1 foot from an exposed face, there is a daily variation in temperature of about 2 degrees when the daily variation in the temperature of the air is about 50 degrees.

3. In the case of concrete 2 feet from an exposed face, there is a daily variation of less than 1 degree when the daily variation in the temperature of the air is about 50 degrees.

4. In the case of concrete 3½ feet from an exposed face, no daily variation in temperature is apparent when the daily variation in the temperature of the air is about 50 degrees.

5. The seasonal variation in the temperature of concrete 3½ feet from an exposed face is about 32 degrees when the seasonal variation in the mean daily temperature of the air is about 75 degrees.

6. The experiments have not yet been carried far enough to show the seasonal variation at other distances from exposed faces, but it is probable that they become very much less as the distance from the face increases.

CULVERT FACTS AND NEEDS.

If culverts are not built of good material they will have to be rebuilt in a few years, whatever the quality of the roads they are made to serve. Defective culverts vitiate one of the elementary principles of highway economics, and the interests of the taxpayers require that the annual cost of every part of the roads built for their use be reduced to the lowest possible figure consistent with efficiency.

In building a culvert the road-builder must observe three fundamental requirements:

1. The first requirement is that the culvert must be so placed that it will drain across the road, and under the road, of course, all the water that is delivered to it by the side ditch along the road. If this be not done, the earth along the road and about the end of the culvert will be wet and soggy the most of the year and the culvert opening will require almost constant repairs. Repairing a highway culvert is relatively more expensive than similar work in a town because of the waste of time of the workmen in going to and from the point at which the work must be done. In placing the culvert care must also be taken that it will not be choked by brush and leaves, and this duty must be discharged by the road supervisor, and will be, if he is worth his salt.

2. The second and very important requirement in the building of a culvert is that its ends must be protected by some kind of wall or facing carried down to a firm foundation. If this be done, it will be found that the end of the culvert will not be undercut by the water and will not be broken, frost will not injure it, the surrounding or superincumbent earth will not slide down into the ditch in front of the opening, and, with the further necessary work of keeping the feeding ditches clear, the culvert will be able to take care of all the water alongside the road.

3. The third requirement is that the culvert must be made so strong that it will not become broken and so tight that it will not leak. These ends can be reached by building the culvert of masonry, concrete or of good piping. The material to be used must be determined by the relative cost of the several materials at the locality where the culvert is to be built and by the distance from the top of the culvert to the surface of the road. All technical features of culvert building are explained in pamphlets printed for the use of road supervisors by the highway departments of most States and by the United States Office of Public Roads and Rural Engineering at Washington. These pamphlets can be obtained free of cost upon application, so that it is possible for all road supervisors to be their own culvert builders by following instructions. After all, the road supervisor is a most important factor

in this work. If he looks after his culverts well, he ought to be retained in office; if he does not, the sooner he can be replaced by one who will do so the better for the public that uses the roads and particularly for the taxpayers who pay for them.—American Highway Association.

A LESSON IN PREPAREDNESS.

Just at present preparedness has taken the center of the stage, while some other issues which were in danger of becoming thread worn have been placed in the background.

Chattanooga, Tenn., is one of the cities which has voiced its favor of preparedness in a public demonstration intended to arouse interest for "America First."

In the Chattanooga preparedness parade, one forcible illustration of our national unpreparedness was presented in the form of floats illustrating Tennessee's bad roads, which incidentally are no worse than the bad roads of many other states, while as a counterpart of this bad road illustration there was a float showing the contrast of the concrete paved highway. This exhibit, entered by the Dixie Highway Association—which, in fact, was responsible for the whole demonstration—won the first prize. Richard Hardy, second vice president of the Dixie Highway Association, and president of the Dixie Portland Cement Co., took an active part in arranging this forcible object lesson of a very important phase of our unpreparedness.

The accompanying pictures illustrates the floats which drove home this lesson and won the prize.

NEW CONCRETE PRODUCTS VENTURES.

The Armor Concrete Co., Los Angeles, Cal.; capital, \$10,000; incorporators, M. W. Hendrick, R. A. Wattson and W. W. Gosling.

The Hydraulic Reconstructed Stone Co., Augusta, Ga., for the purpose of manufacturing concrete blocks; incorporators, T. M. Morris, T. Plunket and T. H. Sherman.

Watertown Concrete Co., Watertown, Mass., capital \$100,000; incorporators, Harold Plimpton, George Marsh and W. N. Trowbridge.

The Stanley Reinforced Concrete Co. has been incorporated at Centralia, Wash.

CONTRACTS FOR CEMENT SIDEWALKS.

The board of public works of the city of Superior, Wis., on June 15 awarded contracts for the construction of twelve miles of cement sidewalks costing approximately \$30,000. Three contracts were awarded to Ed. Johnson, the same number to Ed. Swanson and one to the Russell Construction Co. The above contracts demonstrate that the smaller

cities of the country are alive to the fact that concrete is coming more and more into favor as the logical material for sidewalks.

LOOKING FORWARD.

When I wuz jest a little tad
I useta ramble 'round,
A-snooping' curious in and out
The fact-rys of our town.
A wagon wheel there wuzn't made,
Ner buggy put together;
But that I watched with eagle eye,
No matter what the weather.
Sometimes I'd git right in their way,
And then get pushed about;
With eyes chock full I didn't mind
The fact they shoved me out.
I've watched the old mill grind its grain;
'Twuz music to my ears,
The hum of wheels and waterfall
I hear in after years.
But no place could quite hold my gaze
And keep me sticking there
Like the plant where experts made cement
With the greatest kind of care.
From end to end I trudged around,
I saw rock turned to flour;
And tons and tons wuz made each day,
With earloads shipped each hour.
As years roll by I won't fergit
The hours I useta kill
A-ridin' on the "dinky" from
The quarry to the mill.
And as I look around me now
And see the buildings grand,
I know what concrete means to us,
All over this broad land.
One thing's a cinch; take it from me,
Concrete's the thing to use;
With Portland Cement, sand and stone,
And water, you can't lose.
When you build for your money's sake,
Just git right good cement to make
Concrete for permanence.

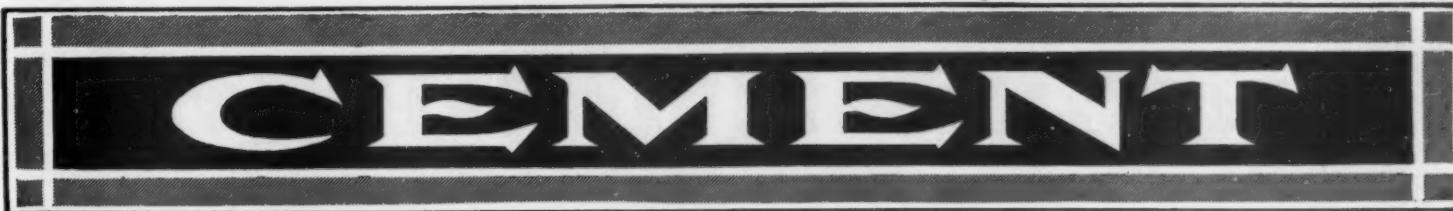
The Eagle River Cement Construction Co., of Eagle River, Wis., is devoting newspaper space to illustrated advertisements of cement construction. In a recent advertisement the company said: "This is the age of cement. Cement and concrete construction embody the modern ideas in building. Clean, sanitary, everlasting, fireproof construction at lower cost than old methods. Look over our work and then let us quote you a good price for that next piece of concrete work, whether it be walk, fence post, barn, silo, foundation, wall or whole house."



A PRESENT HIGHWAY.



A GREAT IMPROVEMENT.



LOOK FOR ADVANCE IN PRICE.

New York, July 21.—Portland cement dealers are advised to get their cement stocks in early before Sept. 1 because conditions are making for a sharp readjustment for eastern prices at about that time. The peak has been reached in structural steel and some of the basic building commodities due to the higher cost of raw materials, but the eastern cement plants have not advanced their prices as the other commodities have, thereby making a sharp advance of at least ten cents per barrel by Sept. 1 probable. The Portland cement dealers in New York have been buying very light since July 1.

TO CONSTRUCT NEW CEMENT PLANT.

Cumberland Gap, Tenn., July 18.—Details of the Portland cement plant which the Cumberland Mountain Minerals Co. is to construct at Cumberland Gap, Tenn., just over the Kentucky line, have been settled. The establishment is to have a daily capacity of thirty carloads and it is estimated will cost nearly half a million dollars. Construction involves removal of the plant of the Lumbermen's Cement & Brick Co., of Carlyle, Kan., which has been purchased by the company, to Cumberland Gap, where it will be erected on a 300-acre tract of land which contains almost inexhaustible quantities of limestone and shale. Extensive additions will be made to the machinery equipment of the old plant and the resulting factory at Cumberland Gap promises to be of a high order. Victor Buetner, of Knoxville, Tenn., is president of the corporation.

COLOGNE CEMENT INDUSTRY SUFFERING.

The manufacture of Portland cement is an important industry in the district of Cologne, Germany, according to the report of Consul Emil Sauer, but the industry has suffered since the war began on account of depression in the building trades and there appeared to be a slackness in building activity for some time even before the war.

The capacity of the plants has grown much beyond the demands of the market. In view of the pool (the Rhenish Westphalian Cementverband), a number of separate companies erected large additional factories, in order to assure themselves particularly high allotments of the prescribed output. This explains the fact that the percentage of actual output is low.

UNITED STATES CEMENT IN DEMAND.

Cement made in the United States has taken the place of the German product in Haiti, according to Consul John B. Terres, Port au Prince. A large quantity of cement, as of other articles does not figure in the customhouse statistics, since it enters free of duty, in accordance with concessions to that effect. Thus the contractors for the reconstruction of the streets imported 75,000 bags during 1915. One firm has made a contract with the Holland line of steamers for freight for 10,000 bags monthly during 1916.

The Dixie Portland Cement Co., at Richards City, Marion county, Tenn., recently distributed \$40,000 in dividends. Most of the stock is held by Chattanooga men.

Cement Making in the Philippines.

Prior to 1898 there was not a ship load of Portland cement per year that went into the islands, from all sources. Since then not thousands, but as high as one million barrels, have been shipped in in one year. The cause for the increased consumption is due to two things: a desire for better building material and the construction of modern fortifications.

A company known as the Rizal Cement Works has been formed, not of enterprising Americans, as you might suppose, but of leading Spanish and Filipino capitalists. The organization has just built its mill at the town of Binangonan. The plant, with its interior equipment, cost three-quarters of a million dollars, or one and one-half million pesos. The enterprise is the largest industrial investment of purely local capital in the archipelago.

The capacity of the plant on beginning operations was 2,000 43-kilo water-proof sacks per day of standard specification Portland cement. Sad to relate, the machinery came from Germany, being of Krupp make. Two 125-ton locomotives used at the

GOLDEN DUST.

The cement mills of the country have been growing with enormous momentum. In their rapid pace it was to be expected that some of the smaller opportunities for profits would be overlooked. It has just been discovered that the dust from these mills, collected and conserved, can be made to contribute at least one-fourth of the potash supply required by the United States.

Cement dust was said to be killing the orange groves of California. It settled on the leaves and prevented their getting the nutrients of the air. Confronted with this, the cement makers began to buy surrounding orange groves at the rate of \$1,000 an acre. But this proved an expensive remedy, so an effort was made to collect the dust before it even escaped to clog the leaves of orange trees. When this dust was examined, it was found rich in potash. A process of obtaining the potash was devised and it is expected that this will be rapidly installed with great profit in many cement mills.

For decades the country has bought potash. But



FIRST CEMENT PLANT IN THE PHILIPPINES, COST \$750,000, CAPITALIZED BY FILIPINOS AND SPANIARDS

plant also came from Germany, as did two enormous electric dynamos. From this it will be seen that the Filipinos do not hesitate to go abroad to spend their money.

A feature of the mill is a long aerial cable running from the quarry to the plant. Material is carried in iron buckets for a distance of seven kilometers. There are 85 buckets mounted on this cable, and each holds one fourth of a ton of material.

Although the present capacity of the plant per day is but 500 barrels, the machinery is so devised that the output can quickly be doubled. This it is planned to do within a very short time, making the output 1,000 barrels per day. It is estimated that a daily output of 1,000 barrels will meet just about half the demand for cement.

The product of the new factory is put out in sacks made in the Philippines. The sacks are a water-proofed, paper-burlap affair. They weigh 100 lbs. when filled.

Our government, both insular and federal, is doing much cement construction in the islands. The material is used largely by the civil government in bridge building and for architecture. The military people are using vast amounts of the material for sea coast fortifications, and it is very probable that the domestic Rizal brand will be used as far as the supply will permit.

this demand did not arouse the efforts of the cement makers to utilize their by-product. Not until the complaints of orange growers drove them to action did they really study their dust problem.

America is full of thousands of such unknown and untouched sources of profit. Countless wastes remain to be sought out and utilized for some profitable purpose. This is the real essence of the conservation problem—eliminating waste wherever it exists, eliminating waste in time, materials and energy in every field. The necessity of thrift confronts America in order that it may be prepared for any exigency after the war.

MANUFACTURERS AND WORKERS NEGOTIATING.

Prospects of a settlement of the cement workers' strike, which has been in existence at the LaSalle and Oglesby (Ill.) plants, are becoming brighter. The manufacturers are negotiating with the workers in the hopes that an early settlement may be reached.

It is quite generally believed that the workers went on strike and are still out against their will.

The Superior Portland Cement Co., American Bank Building, Seattle, Wash., has increased its capital to \$1,500,000.

ROAD BUILDING

Offers Plan for Border Boulevard.

Henry B. Joy wants the United States government to build a border highway all around the United States, working in the same manner that the Panama Canal was constructed.

The proposed federal highway system provides for a spiderweb of roadways that would be a wonderful aid to the country in time of war and of inestimable value to the people of the country from a commercial standpoint. The procedure advocated by Mr. Joy would take the matter entirely out of the hands of Congress and have the road mapped out and constructed entirely by United States Army engineers.

Mr. Joy's plan, in connection with the Lincoln, Dixie, Jefferson and other arterial highways, would enable the freest and most elastic system of transportation between states and would permit the speedy mobilization of men and supplies on any part of our border. It would be the beginning of a network of permanent, hard-surfaced, connecting roads that would permit the transportation of farm products, in time of peace, at a cost per ton mile of just one-fifth of the present average cost.

The suggested border boulevard would start at New York City and follow the coast fifty to 100 miles inland, through New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi and Louisiana, then nearer the border through Texas, New Mexico, Arizona and California, following the valley route through that state to Oregon and Washington, where it would turn along the Canadian border. It would pass through Idaho, Montana, North Dakota, Minnesota, Wisconsin and along the Great Lakes through Illinois, Indiana, looping up through Michigan, then along the southern shore of Lake Erie, along Lake Ontario and the St. Lawrence to the Atlantic coast, circling through the state of Maine; then following the Atlantic coast inland through New Hampshire, Massachusetts, Rhode Island and Connecticut to the starting point at New York City.

Mr. Joy would have this highway connect with the

Lincoln Highway, the shortest and most direct route between New York and San Francisco, the Dixie Highway, the Jefferson Highway and the Santa Fe Trail.

"It is well within the proprieties and infinitely of more value to the United States than the Panama Canal," said Mr. Joy. "It would be a public work of inestimable value in civil life as well as of a national necessity in the work of military preparedness. Such a work would be removed utterly and entirely from any politics and should be put in the hands of an army officer to execute exactly as Colonel Goethals executed the work of the Panama Canal, without hindrance by political pulling and hauling as to the details of the route."

ENTHUSIASM HIGH AT MISSOURI MEETING.

An easterner, with an old-time opinion of Missouri and the Ozarks, would have gazed long and wonderingly at Springfield had he been there on June 27 and 28. Springfield is in the heart of the Ozarks. The word Ozarks generally brings to mind such terms as "back woods" and "hill-billies." A southern Missouri convention of 3,000 people would have been an impossibility in the days of "A Shepherd of the Hills." Times change. What makes it the more remarkable was the fact that this gathering was in the interest of good roads.

Chicago, earlier in June at the Auditorium or the Coliseum, had nothing on Springfield. Delegations cheered, badges and banners fluttered, bands blared and demonstrations took place on the convention floor, such as never before saw the light outside of political conventions. Gatling gun addresses, speeches and orations kept the audience in a fine state of enthusiasm all day.

The association is five years old and has as its purpose the promotion rather than the building of good roads in the Ozark country. More than 600 miles of good roads have been marked since the founding of the association and such roads are supposed to be maintained to the high standard set by

the association. The program for the future is an ambitious one.

Cyrus Avery, road commissioner of Tulsa County, Okla., succeeded W. H. (Coin) Harvey in the presidency of the association.

Selection of Motor Trucks.

The matter of selecting motor trucks for hauling road material is a very important feature of the modern equipment of the road contractor's outfit. Local teams and labor are unavailable, and are worthless if they were available. No road contractor at the present time can afford to be piffling with any such thing as local help and local teams. The motor truck is the only feasible vehicle with which to undertake the transportation features of modern road construction.

Some contractors have provided themselves with the very heaviest possible truck, some of them having the capacity of ten or twelve tons of net material. The truck itself weighs another seven to 10 tons, making 20 tons for the total load upon the ground or other surface to be traveled over. This makes two and one-half tons of pressure at each of the four bearing points, which is more than any surface can bear except very hard and well laid pavements. Many of the bridges in rural districts have not been built strong enough to carry such a load with safety. Even the seven-ton trucks have been found too heavy to be entirely practical and effective over a long stretch of road improvements where the conditions vary considerably throughout the route.

Probably the most economical and effective outfit is the five-ton motor truck, which is light enough for the average country bridge and also light enough to keep from wearing and cutting a surface that is none too hard to start with, so as to make it impassable or very hard going. It is well to provide as many trailers as the traction developed by the motor truck will draw in the particular locality where the work is being done. A five-ton motor truck with a five-ton trailer gets exactly the same amount of material to the job as the ten-ton truck, but there are eight bearing points instead of four, so that the load is distributed more efficiently, and in such stretches of the work as the five-ton truck will draw two trailers it is just one and one-half times more effective than the ten-ton truck, which is often its own undoing on account of the concentration of the load.

The efficiency of motor truck service is tremendously improved where any kind of a rehandling apparatus is provided at the loading end of the motor truck trip. The more efficient this apparatus the less time will be wasted in the process of loading. To shovel the load upon a motor truck by hand is just exactly the most inefficient way to perform that indispensable function. Loading devices, especially designed for this purpose, have been provided by several of the equipment concerns and are proving of tremendous advantage in regular service.

Motor truck equipment for the road contractor, as well as the quarry operator, is a very important adjunct to the profitable operation of the crusher, and they will become more important as the road improvements become more extensive in the immediate neighborhood of the crushing plant, so that independent deliveries can become the general feature of the business in place of just the opposite condition now existing as in the past.



PROPOSED BORDER HIGHWAY AND OTHER GREAT TRUNK ROADS INDICATED WOULD CONNECT PRACTICALLY EVERY STATE WITH THE BORDER AND WITH EVERY OTHER STATE.

BANKHEAD BILL SIGNED BY PRESIDENT.

The Bankhead Bill, which has passed both Houses of Congress and which has been signed by the president, appropriates \$75,000,000 for the same purpose and in addition \$10,000,000 "for the survey, construction and maintenance of roads and trails within or only partly within the National forests, when necessary for the use and development of resources upon which communities within and adjacent to the National forests are dependent." The appropriation made for the roads and trails in the National forests will not be available except upon a co-operative agreement made between the state, territory or county and the secretary of agriculture "for the survey, construction and maintenance of such roads or trails upon a basis equitable to both the state, territory, or county and the United States," and provided, further, that "the aggregate expenditures in any state, territory or county shall not exceed ten per centum of the value as determined by the secretary of agriculture, of the timber and forage resources which are or will be available for income upon the National forest lands within the respective county or counties wherein the roads or trails will be constructed."

The title of the bill has been changed, by agreement between the two houses, to read: "An act to provide that the United States shall aid the states in the construction of rural post roads, and for other purposes," among the "other purposes" being roads "which may be used in the transportation of interstate commerce" and "military supplies." The act will be operative only under such rules and regulations as the secretary of agriculture shall prescribe, in the formulation of which he engaged immediately upon the passage of the measure. The organization of this work imposes an enormous burden upon the department of agriculture, involving as it does a practical, not to say an intimate, knowledge of all the varying conditions of the public roads situation throughout this vast country—the differences in local administration, the confusing variety of laws, the difficulties in topography that must be met, the educational lessons that must be impressed upon the people so that they will understand that the United States has entered into a partnership with the states for the benefit of the people, but an equal partnership requiring equal performance of both partners in every case.

The good roads problem is wholly practical; there is no politics or sectionalism or special privilege in it. It was not designed in the interest of any existing or projected highway system—the secretary of agriculture, in agreement with the highway department of each state will determine where the roads shall be built and of what material they shall be constructed. Besides being distinctly constructive in character, the bill is wholly constitutional in form, especial care having been taken by Congress to protect the fundamental law from the violation of any of its sacred precepts. The law not only declares the policy of the Government that the construction of good roads is a necessary and essential exercise of Federal duty and authority; but defines the conditions under which such duty and authority may be, or shall be exercised, and in what manner Federal aid in road building may be obtained by the states. The law appropriates, "out of any money in the treasury not otherwise appropriated," \$75,000,000 for the construction of rural post roads, of which \$5,000,000 will be available for the fiscal year ending June 30, 1917; \$10,000,000 for 1918; \$15,000,000, for 1919; \$20,000,000 for 1920, and \$25,000,000 for 1921.

The allotments of the Federal fund to the several states will be made by the secretary of agriculture in this manner: One-third in the ratio which the area of each state bears to the total area of all the states; one-third in the ratio which the population of each state bears to the total population of all the states, as shown by the latest available Federal census; one-third in the ratio which the mileage of rural delivery routes and star routes in each state bears to the total mileage of rural delivery routes and star routes in all the states, at the close of the next preceding

fiscal year, as shown by the certificate of the Postmaster General.

The law provides not only for Federal aid in the construction of rural post roads but also for their repair and maintenance after they have been constructed and that such repair and maintenance shall be a charge upon the states or political divisions in which the roads are constructed; and that no further apportionment of Federal funds shall be made to any state or division in which the repairs and maintenance have not been made to the satisfaction of the secretary of agriculture. No public road can be built under the terms of the law until its location, character and cost have been approved by the secretary. Every road project with the plans, specifications and estimates of cost must be approved by the secretary before any part of the Federal appropriation can be apportioned to it under the law. The secretary is forbidden by the law to approve any road project which is not "substantial in character." He cannot make any payment for the construction of any road in excess of \$10,000 the mile. The construction work and labor in each state is to be done in accordance with the laws of the state and under the direct supervision of the state highway department, subject, however, to the inspection and approval of the secretary of agriculture without which the state cannot share in the apportionment of the Federal appropriation. The law authorizes the secretary to expend three per centum of the appropriation for any fiscal year for administration.

No state can have any share in the Federal appropriation which does not agree to the terms of the law. It is a fifty-fifty proposition. The state which puts up a dollar for building a rural post road will get a dollar from the United States, upon compliance with the conditions named in the law. Nothing is taken for granted. It is all written down in the law. There is to be no politics in it, no favoritism, no interstate or transcontinental or other highway system already projected or dreamed out by forward-looking men that does not have the backing of the state highway authorities and the necessary approval of the secretary of agriculture. It is a sound business problem thought out by the most careful political economists, constitutional lawyers and plain, ordinary business men with the single object of providing ample ways for the business of the Government and the traffic of the people. Too much cannot be said in appreciation of the faithful and intelligent service of Senator Bankhead of Alabama in pushing this great constructive act to successful completion.

The bill provides federal appropriation of the following sums for each of the years indicated:

1917.....	\$ 5,000,000
1918.....	10,000,000
1919.....	15,000,000
1920.....	20,000,000
1921.....	25,000,000

COOK COUNTY TO BUILD ROADS.

Confirmation of a bond issue of \$1,800,000 for the construction of hard roads throughout Cook county, Ill., was made by the Cook County Board of Commissioners at a special meeting on July 12. The roads are to be constructed of either gravel, rock or macadam. Some of those effected are:

The Niles road, from Niles to Gross Point.

Gross Point road, from the Dundee and Wheeling road to east limits of Gross Point.

Telegraph road, from Timber road to Shermerville.

Milwaukee Avenue road, from River road to State Aid road.

Arlington Heights road, from Rand road to Arlington Heights.

Barrington road, from Cemetery road to Barrington.

Algonquin road, from Desplaines to western boundary of county.

Norwood Park road, for two miles south of limits of Chicago.

Joliet road, from Lyons to county line.

THE WISCONSIN GOOD ROADS MEN MEET.

The Good Roads Association of Wisconsin, recently organized, held a meeting at the Hotel Maryland, Milwaukee, Wis., last week which was preceded by a luncheon. A large number of good road enthusiasts from all parts of the state attended the meeting, at which time officers were elected. Charles C. Jacobus of Wauwatosa, Wis., was chosen president. Other officers elected are: Vice president, Elmer S. Hall, Green Bay, Wis.; secretary, William H. Reese, Milwaukee; treasurer, Ernst Perry, Fond du Lac, Wis.; executive secretary, Frank Cannon, Milwaukee. The following directors were elected: For three years, C. C. Jacobus, Charles Lieke, Chippewa Falls, Wis., and A. H. Zimmerman, Wausau, Wis.; for two years, E. S. Hall, W. H. Reese and R. W. Davis, Bangor, Wis.; for one year, A. R. Hirst, Madison, State Highway Engineer; E. Perry and Walter Reed, Racine, Wis. County vice presidents were also selected for each county in the state.

Charles Jacobus, president of the association, is chairman of the committee on highways of the Milwaukee County Board of Supervisors, under whose direction Milwaukee county has been made "the good roads capital of the middle west."

"The outlook for the Good Roads Association of Wisconsin exceeds our fondest expectations," said Mr. Jacobus. "We have a list of seventy-one strong, active vice presidents working, covering every county. When once our purpose is made known to the business man, banker, farmer or professional man, they enroll under our banner. We propose to aid the good road movement in every way—organization, educational, legislative.

"Our great purpose, however, is to get legislation to secure continuous highways throughout the state—north, south, east and west. Everyone is familiar with the splendid work done in Milwaukee county. Five years ago we laid out our prospective county highway system. Today we have ninety miles of permanent highways radiating to all parts of the county. In a few years the system will be complete. We want to do for the state just what Milwaukee county has done. We want to secure legislation providing for a system of state trunk lines linking all parts of the state.

"Then we desire legislation providing for the financing of these roads. A suggested method is for the state to give additional aid for work done on the continuous highways in each county. This would result in the counties proceeding to build the links of the trunk lines within their borders, because of the larger aid received, resulting in a smaller burden on the county. This would give each county first-class main arteries conjoining with the main roads in the adjoining counties, constituting the state trunk lines.

"Milwaukeeans can see the obvious advantage of this. Once you get off the concrete highways of this county and on the roads of the adjoining counties you are liable to run on to bad roads which rob the good roads of Milwaukee county of half their value. The one remedy for this problem is state legislation to bring about trunk lines as the ultimate unit of results, the county the local unit of effort."

ORGANIZE TO SECURE CONCRETE ROADS.

At a recent meeting of the good roads enthusiasts of Dallas county, Texas, the Dallas County Good Roads Association was organized with Curtis Hancock, of Irving, as permanent chairman and E. L. Fisher, of Western Heights, as permanent secretary. The chief purpose of the association is to "prepare and circulate a petition to the commissioners' court, asking for a bond election for the purpose of concreting the cardinal and intermediate roads traversing the bottoms and low-lands in Dallas county and the replacement by concrete structures of all wooden bridges in the county."

MOTOR CAR TRAFFIC AND TAXES.

In 1905 there were 48,000 motor cars, including commercial vehicles, in the United States, according to the registration statistics assembled by the Division of Road Economics of the United States Office of Public Roads and Rural Engineering; in 1915 there were 2,445,664. This was an increase of five thousand per cent. Ten years ago of the expenditures on account of the building of rural roads and bridges in the United States less than three-tenths of one per cent was derived from the tax on motor vehicles; last year nearly 7 per cent of the money available for this purpose was derived from this source. In 1901 the first revenue derived by any of the States from automobile revenues was collected in New York State and amounted to only \$954. Other States followed the example of New York, requiring the registration of motor cars, chauffeurs and operators, until in 1905 the total amount collected in all the States on this account aggregated \$62,500; last year the revenues from this source amounted to \$18,245,713. In nearly all the States practically 90 per cent of the motor car revenues was applied in 1915 to road work and 70 per cent of this sum was expended under the control and supervision of the State highway departments. In forty-two States all, or a large part, of the revenue from motor cars must be expended for the construction, improvement or maintenance of the public roads, or for the maintenance of the State highway departments. In six States this requirement is not made.

In 1915 the total number of motor vehicles registered in the United States was 2,445,664. The total road mileage in the United States outside of incorporated towns and cities is approximately 2,275,000 miles. This would mean that there is slightly more than one motor car for each mile of rural road in the United States, if the distribution of the cars were uniform for all the States; but it is not, as in the State of Nevada there is one motor car for every six miles of rural road, and in New Jersey six motor cars for every mile of rural road. In the United States there is one motor car registration for every forty-four persons, in the State of Iowa there is one registration for every sixteen persons and in Alabama only one registration for every two hundred persons.

There is no uniformity in the fees required of motor vehicles, and there are wide differences in the requirements for the registration or licensing of chauffeurs, owners, dealers and operators. The tendency is growing to base the registration fees for pleasure cars on straight horsepower; for commercial vehicles the tendency is to require a part of the fee on the horsepower of the car and the remainder of the fee either on the carrying capacity of the vehicle or on its weight. The average fee of the motor cars in the United States, taking them by and large, is estimated at \$7.46. Reckoning on the same basis, the State of Vermont received in 1915 a gross revenue of \$18.10 for each car while Minnesota received only about fifty cents annually for each car, the registration in that State covering a period of three years. In Texas and South Carolina no annual registration fees are collected, the only requirement being a county fee of fifty cents and one dollar respectively for what is called a perennial registration. Many States make no distinction so far as the registration records go between pleasure and commercial cars. A few States register all motor vehicles, including motorcycles, under a single class; in some States the registration of motorcycles is not required.

The registrations and revenues in several typical States for the last three years show the steadily increasing growth of the motor car in the transportation business of the country. Three years ago there were 23,200 motor cars in the State of Connecticut; last year there were 41,121. In 1913 there were 62,660 cars in Massachusetts; in 1915 there

were 102,633. In 1913 there were 13,411 cars in Nebraska; in 1915 there were 59,000. In 1913 there were 134,495 cars in New York State; in 1915 there were 255,242. In 1913 there were 3,000 cars in Oklahoma; in 1915 there were 25,032. In 1913 there were 32,000 cars in Texas; in 1915 there were 40,000. In 1913 there were 34,346 cars in Wisconsin; in 1915 there were 79,741. The total gross revenues from motor cars in these States increased in Connecticut from \$316,667 in 1913 to \$536,970 in 1915; in Massachusetts from \$764,154 to \$1,235,724; in Nebraska from \$26,000 to \$183,000; in New York from \$1,275,727 to \$1,991,181; in Oklahoma from \$3,000 to \$154,892; in Texas from \$16,000 to \$20,000; in Wisconsin from \$190,770 to \$431,977. One of the puzzling things about the matter is that the increased use of the motor car does not seem to be regulated by the conditions of the roads. For example, in the State of Nebraska in the three-year period covered by the figures in the official report, the number of motor cars increased more than four times and the gross revenues eight times while only 275 miles of the 80,338 miles of roads in that State are improved. In Massachusetts, where a little more than one-half the rural roads have been improved, the number of motor cars and the revenues from this source have not quite doubled. In 1913 there were in the United States 1,258,062 motor cars; in 1914, 1,711,339 motor cars and in 1915, 2,445,664. In 1913 the gross revenues from motor car taxes amounted to \$8,192,253; in 1914 to \$12,381,951, and in 1915 to \$18,245,711. Of the revenues from this source available for road work \$11,555,459 is under the control of the State highway departments and \$4,657,929 is under the direction of the local authorities.

The enormous increase in motor car traffic is bound to affect favorably the condition of the public roads of the country as the number of cars and the revenues increase. In the good old patient days when the horse-drawn vehicle was the only means of transportation in the rural districts and time was no object to the people, who took things as they were, it did not seem to matter very much how many holes and ruts and swampy places there were on the roads to market; but it is different now and the motor cars are making smooth and substantial highways necessary to their favorable progress and to the success of business.

It is worth noting that from the time of the old Cumberland highway, surveyed by Washington and built by the National Government, it was not until the automobile had come and proved its practical value as the greatest burden-bearer of the centuries that there was any serious thought of interstate and transcontinental highways that would hold the country together in the closest neighborhood. It was not until wise men at the Capitol discovered the rural free delivery postal routes, that a constitutional way was found to make the Government at Washington an active partner in the enterprise of building good roads for the health of the nation.

The Motor Car Bulletin prepared by the United States Office of Public Roads and Rural Engineering is a most suggestive and interesting contribution to the good roads literature on this subject.

AWARDS CONTRACT ON QUALITY WORK.

A strange policy was started when the City Council of Illino, Mo., on June 12, granted John Rouse the contract for paving 8,530 square yards of street. John Rouse put in a bid of \$1.33 per square yard and the lowest bid was \$1.15. The City Council, after looking at the work of the lowest bidder, decided that he could not do the work to their satisfaction. They also inspected the work of John Rouse, coming to the conclusion that it would be cheaper to pay the high price. The paving will be of concrete, and there was no curb in the contract.

VOTES \$1,250,000 FOR ROADS.

St. Louis, Mo., July 18.—Bonds valued at \$1,250,000 were voted Saturday by the residents of Clay county for the building of a county-wide network of rock roads. The highways when completed will total 202 miles, according to present plans.

Two letters, written to Clay county boosters from Kansas City, could well be added to the literature of good roads. One was from R. A. Long, millionaire lumberman whose "million-dollar farm" is located in Jackson county. In a letter to the secretary of the Clay county committee, Mr. Long wrote as follows:

"While it costs money to build and maintain good roads, I regard the amount spent in this way as an investment rather than an expense. For certainly land adjacent to good roads is much more valuable than land located otherwise. May I say in looking around for the purchase of a farm some three years ago I did not go to Clay county for no other reason than that said county was so far behind with its roads as compared with Jackson county."

The other letter was from W. S. Webb, of the Missouri Savings Bank, to another member of the same committee. Mr. Webb wrote:

"Answering your inquiry, beg to say that we will loan from \$10 to \$25 more per acre on a farm with a rock road than on a dirt road, as we have found from actual experience that the rock road increases the selling price of lands anywhere from \$25 to \$100 per acre. We also find that the rock road does not increase taxes in a like proportion, since the assessor must consider the fact that this land will not produce any more per acre than land off the rock road."

"In our thirty years' experience in this vicinity we have never foreclosed a loan on a rock road, nor have we ever known of a farm that could not be sold quickly. Rock roads never hurt anyone or any country. On the other hand, they have made many of each."

TEXAS AND THE JEFFERSON HIGHWAY.

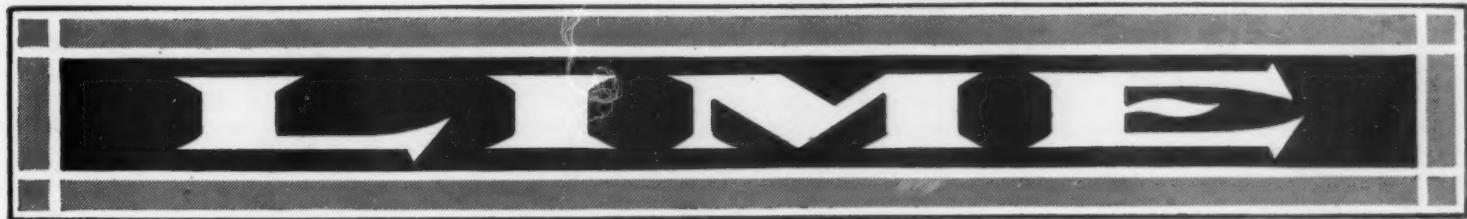
When interviewed recently in Kansas City, J. D. Clarkson, general manager of the Jefferson highway, gave out some interesting figures regarding the progress of work along that international road. Of the full length of the highway from Winnipeg to New Orleans, twenty-five per cent is already hard surfaced; twenty-five per cent is dirt with sentiment strong for permanent construction; fifty per cent is already provided for in the interests of hard surface.

"Texas leads in rapid work," said Mr. Clarkson. "The Jefferson highway crosses ten counties in that state. Eight of them have within the last four months voted a total of three and one-half million dollars in bonds, which will take care of the Jefferson highway and a lot of feeder roads in these counties, and the two remaining counties have both called election and expect to carry them without difficulty. This will provide entirely for the 250 miles in that state."

A. R. B. A. TO MEET IN BOSTON.

The directors of the American Road Builders' Association have decided to hold the next annual convention of the Association and the National Good Roads Show in Mechanics' Hall, Boston, Mass., during the week beginning Feb. 5, 1917. This will be the seventh American Good Roads Congress.

Atchison county, Kansas, is working on its first concrete road. Two and one-half miles have already been completed and it is possible that two more will be added.



For Dealers and Users.

Answering several correspondents at once as to what are the arguments to induce dealers to handle hydrated lime, and the users of lime to select hydrate for their mortar and plaster mixtures, we cheerfully present for the thirty-fourth time our royal flush of five seventy-two centimeter shells that never fail to prove complete and final for every such occasion.

The dealer who handles hydrated lime exclusively will not need to provide an airtight and fireproof lime house or compartment in his warehouse for the storage of lime. Hydrated lime packed in paper bags can be piled in any dry warehouse space without further preparation. The saving to the dealer of the investment in a suitable lime house for the storage of lump lime varies from \$800 to \$1,500 in these times, for a capacity that would represent a stock of a minimum of two carloads and a maximum of four carloads, which is about the average requirement for the dealer handling lump lime exclusively.

It may be kept for an indefinite period of time and without deterioration. It is always ready to deliver and easy to handle, because the net weight is printed in large letters upon every bag, and in this way all the material can be sold without loss or waste.

The principal economic reason for the development of hydrated lime was and is to save the expense and delay in modern building practice that is indispensable for reducing raw lime into the putty state by mixing it with water in a mortar box or a mortar bed of sand. This requires from one week to six weeks, according to weather conditions, for high class results. This often causes expensive delays or introduces the dangerous alternative of using partially slackened lime in the most important parts of construction work, that is in the lower courses of masonry or in the first or base coat of plastering.

The hydration of lime completely eliminates the almost universal difficulty occasioned by "burning" lime in the mortar box and the mortar bed by the unskilled workman now universally employed to do this kind of work everywhere. This practice of "burning" lime completely destroys everything of value in the lime. Instead of making it into a plastic putty it becomes a soggy mess without the property of combining with sand to make a real mortar.

Hydrated lime is a uniform product, manufactured by processes which remove impurities and the physical defects developed in kiln practice. Every pound and ounce of it is useful and active in every possible mixture in which it can be used. Every property of the original lime from which it was manufactured is present in the hydrate. None of its caustic value is lost, and there is little or no tendency to re-carbonization (commonly called air-slacking). It is always ready in the shape of a dry and very fine powder to be mixed with cement or with sand or in any other way that a specification may be devised. It is the great basic material produced in a commercial and workable way, adaptable for every purpose in the building arts, and nearly every other purpose for which lime can be used.

Surely here is enough argument to convince every sensible business man that the great improvement introduced by the hydration of lime is bound to meet with approval and prove satisfactory in every practical application. It is the profitable and economical way of handling and using lime.

There is but one precaution necessary, namely poor quality imitations of hydrated lime are often offered for sale which cannot be depended upon, and seldom

give satisfactory results. Do not judge hydrated lime by the performances of such goods.

You can make no mistake when buying hydrated lime to confine your purchases to those brands advertised in this journal, which are available in every market. Both the goods and the men responsible for their integrity are right, else you could not find them in the pages of ROCK PRODUCTS AND BUILDING MATERIALS.

RETURN OF LIME PLASTER FOR SCRATCH AND BROWN COATS.

From Hydrated Lime Bureau.

It will be recalled by some of the older contractors that up to about eighteen or twenty years ago the only material used for scratch and brown coat interior plastering was lump lime and sand, with the necessary proportion of hair. Plastering in those days was first class in every respect, as is evidenced by the many jobs standing in all localities of the United States in an excellent state of preservation.

The only disadvantage with the use of lump lime was that it was necessary to slake the lime on the job. This was an inconvenient method to follow as it required valuable space to do this work and it was necessary to leave the lime buried for days and sometimes weeks to insure thorough slaking.

About twenty years ago gypsum plaster was manufactured and marketed, and as it was unnecessary to slake gypsum in the same manner as lump lime, this was considered an advantage, as the present day methods of speed in building construction were just beginning to evolve. In the preparation of gypsum plaster, it was necessary only to add sand and mix with water and then apply to the walls. This advantage permitted gypsum plaster to become quite popular, and the manufacturers enjoyed a healthy growth from year to year.

Incoming of Hydrated Lime.

The natural growth of nearly every industry during the past fifteen or twenty years has been the necessity for developing new and modern methods of manufacture, many of which pertain to the methods of manufacturing and preparing materials used in building construction. One of the latter was a method for slaking lime at the plant of the manufacturer. There are several methods of manufacturing hydrated lime. In short, all of the methods consist of keeping the amounts of quicklime and water under strict control and when the process of manufacture is completed there is just sufficient water retained to satisfy the chemical requirements of the lime. The resulting product is a soft, white, dry powder known as hydrated lime, and is shipped in paper bags containing forty or fifty pounds. This dry powder also has an affinity for absorbing still further quantities of water, and when water is added there results what is known to the building trades as lime putty.

Hydrated lime was recognized as a more satisfactory material to use than lump lime and has been gradually growing in tonnage. The advantages of hydrated lime over other forms of lime are well known by all who have used it, but mention may be made of a few of the advantages:

Hydrated lime is purer than the quicklime from which it is made.

It is easily subjected to inspection and tests. Does away with the slaking of lump lime, hence,

saves the cost and the space required for this operation.

Hydrated lime makes it possible to maintain definite proportions.

Hydrated lime requires no ageing to be assured of thorough slaking.

Mortars made with hydrated lime are stronger than those made with lump lime.

Hydrated lime can be stored without danger of fire.

Putty made from hydrated lime does not require screening.

For several years, many architects and builders have desired to return to the use of lime plaster as they have recognized in it the ideal plastering material, but could not be inconvenienced by using lump lime. Hydrated lime, however, carrying none of the disadvantages of lump lime, presented the opportunity of again using a material for interior plaster which would give them the results which are desirable in this class of construction.

Sound Deadening.

All materials used in building construction absorb sound; some absorb very little, while others absorb large proportions. Hydrated lime plaster is in the latter class. It is a much better absorber of sound than gypsum plaster.

When sound waves strike a wall, the following occurs: Part of it is reverberated, part is absorbed, and part is transmitted, the amounts being reverberated and transmitted depending entirely upon the proportion which is absorbed and deadened. It therefore follows that the wall plaster absorbing the greatest proportion of sound should be one of the factors to determine the kind of plaster to be used in residences or other buildings wherein quiet conditions or acoustics are desired.

In the process of drying on the wall, all of the water used in mixing hydrated lime plaster is absorbed either by the atmosphere or backing material to which it is applied, and there remains thousands of minute dead air cells. As the porosity of a wall plaster is one of the factors determining its ability to absorb sound, it will quickly be recognized that these minute air cells are deadeners of sound. Hydrated lime plaster minimizes the annoyance of sitting in one part of a building and being compelled to listen to what may be occurring in another part, a very large portion of which is transmitted through the walls. For this reason a large number of architects have, within the past few years, turned from the use of gypsum plaster to hydrated lime plaster for such buildings as hospitals, residences, apartment houses, school houses, hotels, etc., as it is realized that quiet conditions are desirable in all such classes of buildings and that hydrated lime plaster best serves their purpose by being a non-conductor of sound.

True and Even Surfaces.

Another advantage of having walls plastered with hydrated lime is its slower drying property. Upon applying to wood lath, the laths absorb moisture from the plaster and immediately begin to expand and this expansion continues for several hours. If the laths are spaced closely together, which is very often the case, they expand to a point where there is no more free movement toward each other. Expansion, however, continues, and it continues along the line of least resistance. Since they cannot move toward the studding, the line of least resistance becomes the plaster, which is forced out along the horizontal edges of the laths. This gives the

surface of the plaster a very uneven appearance and often cracks the plaster. Hydrated lime plaster remains soft a sufficient length of time to permit the plasterers going over the surface with a wooden float after the expansion of the laths has taken place and again making the surfaces true and even, in which condition they dry out and remain, thus eliminating lath cracking.

Protection to Metal Lath.

Another fact connected with hydrated lime plaster which impels architects to write specifications for plaster in favor of hydrated lime, is the element afforded in the protection of metal lath against corrosion. Corrosion will not take place except in the presence of dampness. If a plaster contains any element which may be liberated upon becoming damp, such as sulphuric acid, then the corrosive action on the metal lath is accelerated.

Hydrated lime contains nothing chemically which will be liberated upon becoming damp that will have any corrosive action, and therefore is considered as a preservative of metal lath. The following is quoted from the house organ of one of the largest manufacturers of metal lath in the United States, which is a striking indication of the effect of the combination of metal lath and lime plaster.

"Several recent incidents of the remarkable preservation of metal lath have been reported. In one case, when tearing down an old building, a large quantity of old style steel lath, plastered more than twenty years ago with common mortar, was found in absolutely good condition. Another was the result of a hotel fire in which a metal lath elevator enclosure plastered with old-fashioned common mortar stopped the progress of the fire. When later exposed, it was discovered that the lath, which had been put on more than sixteen years ago, was still in excellent condition."

Covering Capacity.

The covering capacity of hydrated lime plaster, as compared with gypsum plaster, is the same. Suppose, for instance, it is desired to plaster directly on a brick or tile wall with $\frac{3}{4}$ -inch grounds, the space to be filled by the mortar is exactly the same whether gypsum or hydrated lime plaster is used. All things being equal, such as grounds, spacing of laths, etc., this holds true for all backing materials so that the same yardage per ton of mixed hydrated lime plaster may be figured as for gypsum.

Assuming the price of two competitive plastering materials to be the same per ton, then the principal factor determining the price of a ton of mixed plaster is the sand carrying capacity of the two materials. A ton of neat hydrated lime has a much greater sand carrying capacity than a ton of neat gypsum. In other words, a ton of hydrated lime, when sanded, will yield a greater quantity of mixed plaster than gypsum. Recommended practice for sanding gypsum is that from two to two and one-half parts of sand by weight should be mixed with a ton of neat gypsum, while recommended practice for hydrated lime plaster is that three and one-half or four parts of sand by weight be added to neat hydrated lime, and herein lies the economic advantage. In certain sections of the United States, where the cost of neat hydrated lime is slightly higher per ton than neat gypsum, the greater sand carrying capacity of hydrated lime offsets the increased initial cost of the material.

A notable example of the very satisfactory results to be gained from using hydrated lime plaster is to be found in the recently completed new Cleveland City Hall, designed and erected under the supervision of J. Milton Dyer, architect, Cleveland, Ohio; Lennox-Holdeman Co., Chicago and Cleveland, being the plastering contractors. Prepared hydrated lime plaster was used throughout for scratch and brown coats and the material, approximating something like two thousand tons, was mixed at the plant of the Cleveland Builders' Supply Company, and delivered at the building site in one hundred pound jute bags ready for mixing with water.

Another striking example of the use of hydrated lime plaster is to be found in the city of Toledo, Ohio. The Board of Education specifies that lime plaster be used throughout in the construction of all of their new school buildings.

The demand for hydrated lime plaster in such buildings as residences, apartment houses, churches,

hospitals, office buildings, etc., has shown a healthy growth within the past few years, and present indications are that this material, on account of the many desirable results arising from its use, together with the convenience of handling and mixing, will continue to be specified and used by an increasing number of architects.

Producers Discuss Merits of Agricultural Lime and Limestone

The third semi-annual conference of the Agricultural Lime & Limestone Association was held in the offices of the Bessemer Limestone Co., 714 Stambaugh Building, Youngstown, Ohio, on Friday, July 7. The meeting was called to order at 11 a. m., with about twenty-five producers present, including representatives from a few of the counties in the state and professors of various experimental stations.

The feature of the meeting was an address by Dr. H. J. Wheeler, of Boston, Mass., on "The Relation of the Agricultural Lime and Limestone Business to the Fertilizer Industry."



G. J. WILDER, MANAGER,
Agricultural Lime and Limestone Association.

President W. H. Hoagland, of Columbus, Ohio, opened the meeting with a short address on the future of the agricultural lime and limestone business and spoke of the wonderful opportunities that were in store for the producers who properly took advantage of the situation.

Manager G. J. Wilder of the association then described some of the work which was being carried on through his office and of the various pamphlets and other information that were being sent to farmers and other interested parties, and then introduced the speaker of the day, Dr. Wheeler, of Boston.

Advertising Ethics Discussed.

Dr. Wheeler opened his talk with a discussion on the ethics of advertising in the lime business and urged the lime and limestone operators not to exaggerate the value of their product as a fertilizer and soil sweetener, but rather to understand its true and, at the same time, limited value for these purposes and to advertise and talk about them always in a correct manner. He stated that he believed exaggeration as to the value of limestone products would only tend to injure the business and that as the future of this industry was so large and important both to the producers and to the farmers, exaggeration at this time would be detri-

mental and would only cause the enmity of the great fertilizer industry, which is so strongly entrenched in the business. Not only that, but he believed it would be good business, not only from the standpoint that the fertilizer industry was so strong, but also as it is a true fact that the lime producers can co-operate with the fertilizer business better because the combination of their products is the best possible fertilizer for land.

Dr. Wheeler stated that some time ago he suggested that the National Lime Manufacturers' Association maintain a bureau by which all lime literature should be censored before going out into the trade, and he still believed that such a policy would be a wise one for any organization, in order that over-exaggeration or misleading statements might not be made by any producers, for, after having it tried out by the farmer on wrong statements and proven unsatisfactory, the value of limestone as a fertilizer in any particular market is then definitely injured.

Dr. Wheeler spoke, as an example of misleading statements, that some lime literature stated that hydrochloride acid is a test as to whether lime is needed in the soil. Dr. Wheeler said that these statements have been erroneously used, as hydrochloride acid only shows whether lime is there or not and does not tell whether the soil necessarily needs lime.

Effect of Lime and Limestone on Soils.

In reminding the producers of some of the functions that lime will carry out in connection with the agricultural lime business, he stated that it will increase the porosity of clay soil, softening it and making it better fit for agricultural pursuits. It improves sandy soil and neutralizes the organic and mineral acids in soils.

In speaking of the value of pulverized limestone, Dr. Wheeler stated that coarse limestone, as sold by some of the producers, was of no value to the soil. This has been shown by experiments in both the Pennsylvania and the Rhode Island experimental stations. Limestone, in order to be of real use, should be ground up and put through pulverizing machinery. All of the stone should go through a thirty- to forty-mesh screen and most of it should be put through a sixty-mesh.

Dr. Wheeler again reminded the producers that they should be careful when stating what lime would do for the soil. Statements have been made that lime is not a fertilizer. Dr. Wheeler says this is not so, that it is a plant food and serves this function in some soil. "Lime is a lime fertilizer," but used with ordinary fertilizer, lime, however, can work hand in hand, but it cannot take the place of commercial fertilizers. There are certain properties in fertilizers that lime can in no way take the place of. Lime is a factor in liberating some nitrogen and certain other properties, but there is not enough of these features in lime as a fertilizer to get along without the other commercial fertilizers. State the truth, and it will help the lime business and also help the farmer more than the exaggeration of the value of lime as an exclusive fertilizer.

In stating further functions of lime in the soil, Dr. Wheeler said that in some soil it lessened the tendency of destruction of nitrates. He also referred to the well-known effect of lime in sweetening soils; also that lime aids in lessening some dis-

eases of vegetables. Again referring to the fact that the lime producers and the farmers should understand when lime should be used and when not to be used, he stated that excessive liming is bad for oats, potatoes and corn, that certain plants do not need it, and that tests must be made and the soil and plant understood before any amount of lime is put on. Alfalfa land can be limed very extensively.

Dr. Wheeler quoted from a number of experimental station reports in the various states to prove the truth of his assertions that lime is not a fertilizer alone and needs other commercial fertilizers and that it is only a supplement to them. One of the Virginia reports, for instance, states that if used alone it may be a positive injury to the land. Dr. Wheeler also had some very interesting experiments at hand showing the value of lime and fertilizer on certain soil and the comparative value of lime used alone as a fertilizer and the value of lime and fertilizer used together. For instance, some experiments were made showing the yield per acre in bushels, first with no fertilizer, second with lime as a fertilizer, and third with lime and a commercial fertilizer together. Some of the results were as follows:

	Without Fertilizer	Lime Only	Lime and Commercial Fertilizer
Corn	38	39	70
Oats	26	25	53
Wheat	25	29	35
Corn	26	34	58
Corn	21	22	36
Corn	31	32	53
Corn	64	60	81
Oats	55	61	91
Wheat	31	29	52

Dr. Wheeler stated that he did not believe that more than one-hundredth of the land that should be limed is now receiving it.

Dr. Wheeler closed his remarks with a number of further experiments proving the value of lime, particularly with a fertilizer, on farm lands. His paper, in full, will be printed in a future issue of *ROCK PRODUCTS AND BUILDING MATERIALS*.

Following Dr. Wheeler's talk, County Agricultural Agent Galehouse, of Mahoning county, spoke on the buying and specifying of limestone in connection with agricultural pursuits.

The meeting then adjourned for lunch, with the attendants as guests of the Bessemer Limestone Co. at the Hotel Ohio, following which a short business session was held in which various particular phases of the business were discussed.

It was decided to hold a meeting of the executive committee at Columbus every month in order to more rapidly advance the work of the association. The first meeting will be held in August. It was also decided that the manager of the association should censor all advertising distributed by the various members and everyone was urged to forward such material to the manager before publication.

At Threshold of Opportunity.

The general attitude of the meeting was that the agricultural lime and limestone business stands at the threshold of a great opportunity for a large production and a successful industry. The approximate tonnage of the members of the organization at present is about 150,000 tons and the association maintains a bureau at Columbus in charge of G. J. Wilder, manager. It is sending out valuable information to farmers and other people throughout the central states. The regular yearly meeting of the association is held in the fall.

The association includes in its membership some of the largest companies doing business in the middle west. The purpose of the organization is to carry on educational work among the farmers and operators of large tracts of land in order that they may use lime and limestone correctly and secure the best possible results.

Through the Farm Service Bureau, opened Feb. 1, 1915, valuable suggestions on the proper cultural and feeding methods have been sent out. Exhibits are maintained at fairs and expositions where farm-

ers are shown the various kinds of lime and limestone manufactured and sold for the building up of worn-out soils.

The association carries on its publicity work along the most general lines and each individual member handles his own particular selling organization. The business has shown an increase of seventy per cent within the past year and all indications point to a larger increase for the present season, due partly to the fact that experts have estimated that less than four per cent of the lands that actually need lime or limestone have ever received an application.

Manager Wilder, in speaking of the general purpose and future of the organization, stated: "We believe that the future possibilities of this business offer an opportunity for the best efforts that this association is able to put forth for years to come. This is a movement of progress, supported by people who have faith in their product and are confident as to the future of this business. Our meetings have been well attended and we always aim to bring before the manufacturers men who are authorities on soil improvement. Lime and limestone have so many good features for agricultural purposes that we are going to conduct our publicity campaigns along the lines of their particular value only, rather than depreciate the products of other concerns. Our work is for the benefit of all and we are all going to work together for a movement which will be far-reaching in effect."

The officers of the association are: W. H. Hoagland, of the Marble Cliff Quarries Co., Columbus, Ohio, president; J. R. Rowland, of the Bessemer Limestone Co., Youngstown, Ohio, vice-president; H. B. Briggle, of the O. C. Barber Mining & Fertilizer Co., Canton, Ohio, secretary-treasurer; G. J. Wilder, Hartman building, Columbus, Ohio, manager. The board of directors, in addition to the officers, are Henry Angel, of the Kelley Island Lime & Transport Co., Cleveland; Peter Martin, of the Ohio & Western Lime Co., Huntington, Ind., and Lawrence Hitchcock, of the Federal Lime & Stone Co., Cleveland, Ohio.

The following were in attendance:

W. D. Galehouse, County Agricultural Agent, Mahoning County, Canfield, Ohio.
J. W. Wirth, A. & C. Lime Co., Canton, Ohio.
R. E. Doneghue, Agronomist, N. D. Agricultural Experiment Station, Fargo, N. D.
W. H. Hoagland, Marble Cliff Quarries Co., Columbus, Ohio.
J. R. Rowland, Bessemer Limestone Co., Youngstown, Ohio.
G. W. Patnoe, Dolomite Products Co., Cleveland, Ohio.
Henry Angel, Kelley Island Lime & Transport Co., Cleveland, Ohio.
H. J. Taggart, A. & C. Lime Co., Canton, Ohio.
J. F. Mollen, Dolomite Products Co., Cleveland, Ohio.
E. P. Foster, Bessemer Limestone Co., Youngstown, Ohio.
Dr. H. J. Wheeler, Ph. D., Sd. D., Boston, Mass.
G. J. Wilder, manager, Agricultural Lime & Lime Stone Association, Columbus, Ohio.
Wm. Urschell, Woodville Lime & Cement Co., Toledo, Ohio.
J. J. Miller, Sugar Creek Lime Co., Sugar Creek, Ohio.
R. F. Lind, France Stone Co., Toledo, Ohio.
J. F. Rhodes, Shenango Limestone Co., Shenango, Ohio.
W. R. Harris, McKeefrey & Co., Leetonia, Ohio.
A. H. Howatt, Carbon Limestone Co., Youngstown, Ohio.
S. D. L. Jackson, Carbon Limestone Co., Youngstown, Ohio.
C. C. Blair, Bessemer Limestone Co., Youngstown, Ohio.
J. C. Moore, ROCK PRODUCTS AND BUILDING MATERIALS, Chicago.

Members of the association who were not represented at the meeting are:

Clydesdale Stone Co., Pittsburgh, Pa.
Ohio Marble Co., Piqua, Ohio.
The National Lime and Stone Co., Carey, Ohio.
The National Mortar & Supply Co., Pittsburgh, Pa.
East Sparta Clay and Lime Co., East Sparta, Ohio.
The Canton Grey Lime Co., Canton, Ohio.
The Ohio and Western Lime Co., Huntington, Ind.
The Jeffrey Manufacturing Co., Columbus, Ohio.

The Pierce City Lime Co., Pierce City, Mo., capital \$40,000; incorporators, W. A., A. B. and L. Raupp.

The United Rock Sand Co., Wilmington, Del., capital, \$200,000; for the purpose of engaging in a general manufacture of cement, lime and plaster; incorporators, George W. Dillman, M. L. Harty and K. E. Longfield.

LIME COMPANY ENLARGES PLANT.

St. Louis, Mo., July 18.—"Business is pretty good, and we are shipping throughout the country, from Minnesota to Tennessee and Wyoming," says W. S. Fitzroy, sales manager of the Ste. Genevieve Lime Co. "Prices are better than they have been. Our hydrate business is increasing, but we haven't noticed a very great increase this year over last."

The bulk of the Ste. Genevieve lime goes for chemical purposes, although some of it is used in buildings. The company has just put in a new switch and a shoot for loading limestone at its plant at Mosher, Mo., and has just completed an additional kiln. The hydrator being of the Clyde type. The plant was erected in June, 1914, in such a way that additional capacity is provided for, there being room



ST. GENEVIEVE LIME CO.'S PLANT AND HYDRATOR AT MOSHER, MO.

for another hydrator. The hydrator now in use takes the lime from five kilns and was installed by H. Misecampbell.

NEW INDUSTRY TO OPEN QUARRIES.

With the growing probability that Muscle Shoals, on the Tennessee river in Northern Alabama, will be chosen by the Secretary of War as the site of the great power plant and ammunition factory for which Congress has appropriated \$20,000,000, the south believes that it will bring about a great increase in its prosperity. One result of the establishment of the plant will be the opening up of many quarries nearby to obtain limestone, which will be used in the manufacture of fertilizer, which will be one of the products of the plant. This section contains thousands of acres of limestone which is ninety-nine per cent carbonate of lime.

The construction of the dam to develop power will mean one of the biggest cement markets of the year. The river is more than one and one-half miles wide and one of the dams will be 100 feet high and the other sixty feet high. Not only will these dams be built but the power-house substructures and similar works will be of concrete.

The Nashville section of the Engineering Association of the South paid a visit to the Shoals recently and made a thorough inspection of the site. R. T. Creighton, president of the Foster & Creighton Co., was one of the speakers at a meeting held at Florence, Ala., and told of the immense amount of limestone which could be obtained for this work.

With the QUARRIES

Federal Aid.

If you want to keep good roads good, you must maintain them, else they will speedily become bad roads and all the money and effort and engineering skill expended in their construction will be wasted, worse than wasted because the man who has a good thing and doesn't know it sins against the light. In this world, no sooner is a thing done than it has to be done over again. Good roads begin to wear out as soon as they are built, good clothes begin to wear out as soon as they are worn. Everything wears out, and there is nothing that wears out faster than a public road which has been builded at great cost and is left to take care of itself. It won't do it. If it is used by the people for whose benefit it was constructed, it will wear away; if it is not used by anybody, the elements—wind, rain, storm and sunshine—will destroy it in time.

It was not until the Office of Road Inquiry in the Department of Agriculture at Washington was established in 1893 that even Uncle Sam with all his steady habits began to take a practical interest in the public roads of the country. How much was lost by his improvidence it is impossible to estimate; but he has learned his lesson and has committed himself definitely to the policy of building serviceable highways for the use of the people under conditions and supervision which will assure fitness for service. With that frugal wisdom which has ever distinguished his adventures in really useful enterprises, however, Uncle Sam does not intend to do a blessed thing without the co-operation of the States. He stands ready to take \$75,000,000 from the general fund in the next five years wherewith to build good roads in the States if the States will put up the same amount for the building of good roads within their own borders during the same period. It is a case of "matching" highway money with the States.

The States that will not play the game will not "share in the pot," whatever that is. But neither Uncle Sam nor any of his relatives would be justified in any such undertaking if there were not ample security in the law to maintain the work after it has been done. This is why the distribution and expenditure of the money appropriated by Congress for good roads have been placed in the hands of the Secretary of Agriculture and why he will depend in large measure upon the efficiency and experience of the United States Office of Good Roads and Rural Engineering, which has evolved out of the old Office of Road Inquiry, in justifying Federal participation in the construction of good roads.

The Office of Public Roads is under the direction of Logan Waller Page, who has devoted his life to this work and who was described in the course of a recent discussion in the Senate as "the ablest road engineer in the world." With his corps of competent engineers, his accurate knowledge of the conditions and necessities of traffic in the country at large, he will be the Secretary's right bower, so to say, in this effort to euche the elements and the politicians. Thank Heaven! there is no politics in the good roads bill just passed by Congress.

Construction and maintenance—these are the twin elements in any practical good roads undertaking. It is worse than folly to build if the building is not to be maintained. How this can be done in the most effective and practical way, how there can be continu-

ous maintenance of the public roads is one of the problems now receiving the careful study of the Office of Public Roads, the experimental road work done under its direction at Washington and elsewhere affording the opportunity of judging "the comparative economy of several types of road with reference to the traffic handled."

For the last six years the Office of Good Roads has been conducting investigations to determine the economic results of road improvement on the prosperity and development of the country. It has also been studying the methods of management, construction and maintenance of roads under local control; but it has found everywhere and in all conditions that there must be a system of maintenance for all roads if the work that is done in building is to have anything like permanent value. There is a very definite and distinct difference between maintenance and repair; filling up a few holes in an improved highway is repairing; keeping the whole road in what may be called in the language of the day "a state of preparedness" by constant vigilance and intelligent service is maintenance. "The best system of maintenance for all roads is that which provides for the permanent and sometimes continuous employment of skilled laborers who have charge of particular sections of road, or who may be assigned to any part of the country or other road units where there is work most needed."

The continuous maintenance system has been adopted in this country only to a limited extent; but wherever it has been adopted it has demonstrated its high economic value. It might not be possible to maintain such a system in all parts of the country because of sparse population and limited resources; but, as the Year Book of the American Highway Association says on this subject, "it would be difficult to find a county which is so poor that it could not afford to employ continuously eight or ten laborers and three or four teams to maintain and repair its principal roads." That would be far cheaper than the labor tax system and it would be vastly more practical than the hit or miss policy which has distinguished the work in the past.

The largest proportion of the public roads in the United States are the earth roads, and they are the most neglected. Inadequately drained, badly placed, oftentimes, and generally left to take care of themselves after they have been constructed they are a constant and increasing expense to the people they are designed to serve, in so-called repairs, in their unfitness for traffic or travel, in the ruinous strain upon the wagons and harness and horses of the farmers attempting to use them and in many other ways. These roads cannot be kept up without intelligent attention. Mud added to mud in the low places will not make a road solid, filling the hollows with fence rails and convenient stones and brushwood from the adjacent woods will not make them good for traffic or comfortable for travel. Dragging these roads at the wrong time of weather or season will not keep them in useable condition. There must be the intelligence of engineer and the labor of wisely ordered working forces to make them suitable for service, and this end cannot be obtained without a definite policy of maintenance. In the good roads bill passed by Congress, the Secretary of Agriculture is required to insist upon maintenance by the States or other political unit as a condition to Federal aid in the building of roads, and there is not the least doubt that he will insist upon compliance with the law in this as in all other respects.

NEW KANKAKEE PLANT IN OPERATION.

With between twenty-five and thirty men at work, the new Cook quarry and stone crusher plant in West Kaskaskia, a suburb of Kankakee, Ill., was started the latter part of June with W. E. Cook in charge as superintendent.

The new plant, which contains a most modern and complete equipment for crushing, screening and for loading the stone, was finished about June 13. Part of the equipment is a large cylindrical screen which sifts the crushed stone to sizes used in road building, concrete construction work or fertilizer. The stone, taken from the quarry located north of the old lime kilns, is especially high in lime and for this reason is said to be excellent for using on soil.

The stone when taken from the quarry is loaded into industrial cars and pulled up an incline track so that a trip dumps the contents into the crusher. The crushed material is then carried up an incline belt to the screen, which after sorting out the different sizes, puts each into a separate bin. The stone is then loaded into cars, set on a reconstructed C. I. & S. spur, which runs past the plant.

The entire machinery is run by a 50 horsepower electric motor.

BANK THE CURVES.

Curves on roads as ordinarily built have a special element of danger when used by automobiles. The higher elevation of the center of the road as ordinarily constructed has a tendency to induce drivers to pass on the inside of the curve, whether they belong there or on the outside. Accordingly in a few States it is now the practice to give the cross-section of the road on curves a uniform slope upward from the inside of the curve to the outside, so that driving around the curve is equally agreeable at any part of the cross-section. This is called "banking" a curve by engineers. In Rhode Island, where all curves are banked on new or reconstructed State roads, the amount of slope given to the road in such a situation depends not only on the sharpness of the curve but also on the grade of the road. If the grade is steep the crosswise inclination is greater than if the curve occurs on a level road. This practice is exactly the same as that of railway engineers, who always elevate the outer rails on curved tracks.

BLAST RIVER BED WITH EXPLOSIVES.

The citizens of Muskegon, Mich., had a lively Fourth of July. They had noise and excitement without a waste of effort.

A ton of nitroglycerin was placed in the old bed of the Muskegon river channel at Muskegon and exploded between ten and twelve o'clock. A number of prominent citizens of the city and state as well as transportation officials of all lines, entering Muskegon, witnessed the work, including Governor Ferris. The purpose of the blasting was to open 50,000 acres of the most fertile land in the state by providing means of transportation.

One of the largest blasts ever fired in Martins Creek, Pa., was in the quarry of the Alpha Portland Cement Co., on Thursday night, July 6, when 32,450 pounds of dynamite was set off.

QUARRY UNDER GROUND.

A prominent quarry operator recently said that he considered his pumping outfit somewhere near the most important part of his equipment. This has been more forcefully emphasized during the last couple of years when the excessive rainfall has kept the dripping seams and transient springs full of water all the time. Quarry pits, which have always been practically dry for two-thirds of the working season, requiring no pumping at all, have carried a great deal more water than was formerly taken into the calculation. Pumping and the power and cost of handling and running the pumps has increased this item materially in very many quarries. It does not take a great deal of rain to shut a quarry down, and once the whistle is blown and the men have come out of the quarry on account of getting soaking wet, it means a day lost and just so many tons cut off of the total production of that season. This makes another burden to the quarryman, because it curtails his output as well as raises his cost at the same time.

In several of the cement quarries, as well as a number of the lime quarries, it has been found feasible to conduct the quarrying operation by means of tunnelling or mining so as to completely sidestep the cost of stripping or moving the overburden of the quarry. It also leaves the land above in all respects just as good for crop purposes as it ever was, and yet not diminishing in any way the volume of output in the quarry.

Weather conditions do not affect quarrying operations that are conducted underground by the tunnelling or mining process. A roof of rock is left overhead, and after the tunnel proceeds for a considerable distance the outside weather conditions do not affect the operation in any way. In summer time there is no such thing as sunstroke or suffering from excessive heat. In coldest winter time, even in zero weather, the men can work in their shirt-sleeves and without gloves. The rain, snow, sleet, or other conditions that close down the quarry completely when it is worked as an open pit do not affect the tunnelling process in the slightest degree. The volume of output of the plant can be sustained just about as well and about as cheaply in mid-winter as it can be in the best record days of spring or fall.

The cost of the electric light system and of air-driven or electric tools is very slight as compared to the increased efficiency that has been obtained by conducting quarry operations in this manner. Several of the very important cement quarries could never be operated profitably until tunnelling was resorted to. We do not know of a single case where tunnelling was once begun that it was ever abandoned afterwards.

The electric juice is available nearly everywhere in these days, and the matter of supplying compressed air for the drills is very simple indeed. All that is necessary is to place the compressor right in the main tunnel with an electric motor to run it and fill the air tank. This is done successfully in nearly all of the quarries that are operated in this manner.

The tunnelling process sidesteps the weather and water proposition completely. Doubtless this suggestion is worth the investigation of a great many of the quarries that have a big face opened up, which could easily be started for tunnelling without any expense whatever.

The method has been very successfully used in southern Indiana, in Illinois, Missouri and elsewhere. Of course, it is not feasible in every case, but in very many places it is doubtless a way out of difficulties which otherwise may be insurmountable.

The Leathem & Smith Co., Sturgeon Bay, Wis., are working on a contract at their stone quarry to supply about 30,000 tons for the breakwater job at Manistee, Mich. The stone is being shipped from Sturgeon Bay by water. Business at the quarry has been brisk this season.

Modern Equipment Spells Economy.

Equipped with machinery of the latest type, and with an output of 3,000 tons of crushed rock a day, the plant of the Columbia Quarry Co., at Krause, Ill., fourteen miles southeast of St. Louis, on the Mobile & Ohio railroad, is one of the most modern in that section, and by its economical arrangement is able to produce material at the lowest market figures. The stone runs high in carbonate of lime and is adapted for a variety of purposes, especially concrete and fluxing. The quarry face is 1,500 feet in length and averages seventy-five feet deep. There is a stripping of six feet of sandy clay, which is removed by a thirty-ton revolving shovel and loaded into one and one-half yard Western side-dump cars, about 400 cubic yards a day being taken away.

Two Bucyrus shovels, a 100-C and a seventy-ton, fitted respectively with three and one-half and two and one-half yard dippers, are used to load the stone. The drilling is done by means of two No. fourteen Cyclone drills operated by ten horse-power Allis-Chalmers motors, from 50,000 to 100,000 tons being shot down in a blast after holes eight to ten feet apart, twenty-five feet back from the face and running the full depth of the quarry are made, forty per cent nitro-glycerine being used. Ingersoll-Rand jack-hammer drills are employed on pieces of rock too big for the shovels, after which the rock is reblasted. Arrangements are being made to allow for 350,000-ton blasts at a time. The cars into which the stone is loaded are of the Orenstein-Arthur Koppel, five-yard, side-dump type, and are hauled to the foot of the incline by a sixteen-ton Porter locomotive, after which they are hoisted by cable.

After the rock is crushed, a No. 12-K Gates gyratory crusher being used, it is elevated by means of a No. twelve Allis-Chalmers elevator and passed over a revolving screen sixty inches by twenty feet, where material under two and three-fourths inches is screened out, the larger stone passing by gravity to a No. 8-K Gates crusher for recrushing. It is then elevated by a No. eight bucket elevator and passed over two screens, forty-eight inches by 24 feet, making two inch, one and one-half inch, one inch, one-half inch stone and dust. A belt conveyor carries stone over two inches coming from these two screens to the bins directly over two No. five crushers, where it is recrushed and passed to a No. eight bucket elevator, where it is again carried to the two last-mentioned screens. A No. three crusher is used to recrush two-inch stone where more fine stone is needed. Allis-Chalmers twenty-five cycle, three phase, 440 volt motors operate all the machinery, with the exception of the steam shovels and locomotives.

Motors of the following horsepower are installed in

the plant: One 150, one 100, one seventy-five, two sixty, one forty, three thirty, one twenty, two ten and two five.

Two vibrating screens of the Jeffrey Manufacturing Co. type, used to rescreen the one and one-half inch rock, form part of the equipment.

The Columbia Quarry Co. has inaugurated a policy of always having in the store piles stone sufficient to take care of any sudden demand, and to this end it has installed a thirty-ton Ohio locomotive crane, with clamshell attachment, for switching the cars and handling the rock to and from the various storage piles. The plant is in charge of John Grob, general superintendent. The office of the company is in the Fullerton building, St. Louis, Mo. The product is shipped to all points within a reasonable freight zone, although no attempt is made to supply the St. Louis market. It is possible, because of the time and money-saving devices at the plant, to make shipments to points more distant than would otherwise be the case.

KANSAS CITY QUARRY MEN BUSY.

Kansas City, Mo., July 19.—The Prince-Johnson Limestone Co. has been operating at as full capacity as possible during the six weeks' strike of building trades. The company had ample outlet for its crushed rock to outside points and its heavy demand indicated that perhaps the lull was useful for getting these outside orders filled. With the resumption of work, the strike having been settled, the demand is very heavy. The only hampering of production of crushed rock is the hot weather, which makes labor in the quarries excessively uncomfortable, and results in some difficulty in keeping workmen going at desirable speed.

While the many contracts being let for street improvements in Kansas City are largely increasing the demand for crushed rock, most of this street work, and indeed much of the smaller work, is being supplied by the "wagon crushers." These, because of their proximity to the jobs, and because they do not have to use railroad cars, can usually make better prices on the rock, which is one of several reasons for their being left to that field of effort.

NEW QUARRY VENTURES.

The Stone Products Co., Muskegon, Mich., has increased its capital from \$5,000 to \$10,000.

Oley Valley Quarry Co., Reading, Pa.; capital, \$7,500; the company operates limestone quarries near Oley Line and has been established for some time; J. H. Beecher, Boyertown, Pa., treasurer.



MODERN PLANT OF COLUMBIA QUARRY CO. AT KRAUSE, ILL.

SAND and GRAVEL

Preliminary Scrubbing Achieved.

So many gravel plants are not properly equipped to thoroughly wash the sand and gravel as it comes from the bank. With a set of standard washing screens only a limited amount of clay and loam can be taken out and if the percentage at times runs higher than usual or the plant is "pushed" beyond the regular capacity, the material is not washed clean and the owner immediately gets into trouble. He resorts to every kind of expedient to "get away" with it. He turns the hose on the loaded car of gravel, which makes the top of the load look clean and trusts that his customer will not notice the mud which he has washed down into the bottom of the car.

He also has his men scrape off and throw away the skin of mud and clay from the top of the sand cars. This is a waste of material as well as extra labor. He does not improve the material much and practices a deception on his customer.

How much better for him if he had made preparation in his plant design and arranged for a "preliminary scrubbing" before he put the material into his washing screens.

The Raymond W. Dull Company, of Chicago, saw the need of preliminary preparation and were the first to introduce suitable machinery for this purpose. They first introduced a frusto-conical cylinder with lifting paddles inside for agitating and breaking up the impurities. The cylinder was so designed as to retain a quantity of water all the time in which the material was "churned about," scoured and impurities reduced to solution in the water. They now have gone a step farther and in-

stead of one chamber for agitating, the scrubber has four chambers in series.

The material is introduced into the first chamber with the water and receives its first agitation. It then is automatically discharged into the second chamber, where it gets more scouring and agitation and progresses to the third and fourth chamber in the same manner. It is readily seen that the scouring is very thorough and the repetition of this scouring four times makes the process very thorough.

The design of the scrubber is well adapted to connect ahead of the inclined conical gravel washing screens which need no introduction to readers of ROCK PRODUCTS AND BUILDING MATERIALS. More screens of this type are installed than any other, and the simple and direct driving connection, together with the high screening efficiency, is the reason. To explain why the screening efficiency is high is because it is the first third of the length of any screen that does nearly all the work. The remaining two-thirds of the screen handles the stragglers which the first part did not screen. By referring to the illustration it will be observed that the first third which does the work is the large diameter which has the largest screening and wearing area.

The latest type of screens are also provided with drip rings which prevent the muddy washing water from dripping from the end of the screen into the bin below. Any screen on account of its inclination has a tendency to carry water down its plates, which does not drop off the plates on account of the revolving motion until the end of the screen is reached. The drip rings trap this water and deliver it back into the water pans.

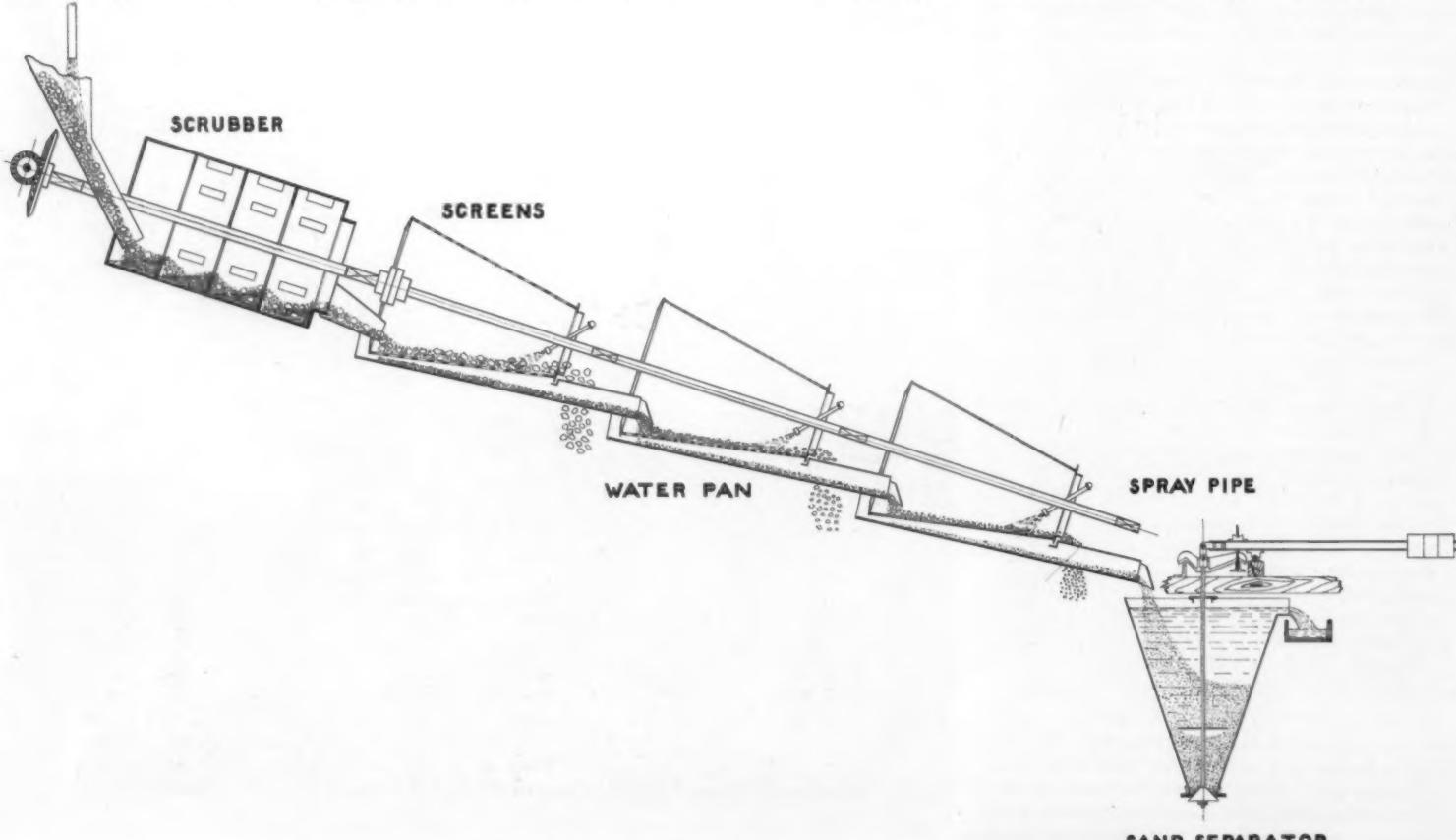
Another very important advance in gravel plant

equipment is the conical type sand separator. Extensive experiments were made to determine the correct shape of tank and the proper relation of the scale beam levers to the valve motion of the tank.

The tank body has been experimented with during the last three years to obtain a slope of the sides to insure positive operation of the most sluggish material. The sides are so steep that the material will not cling to the sides and refuse to discharge. The tank is suspended direct to scale beam levers with knife edge rocker supports, thus insuring weighing the contents of the tank within a few pounds.

The operation of the tank is as follows: The water with the impurities in solution with the clean sand which has been thoroughly scoured is delivered to the sand separating tank. The sand settles to the bottom of the cone and the muddy water continuously flows from the spillway at the top. When a sufficient quantity of sand accumulates in the tank, the tank becomes heavier than the scale beam counterweight, which causes the weight to rise. The valve rod is direct connected to the counterweight beam on the opposite side of the fulcrum support and the raising of the counterweight drops the valve rod, allowing some of the sand to escape from the tank. When a sufficient quantity of sand escapes the tank then becomes lighter than the counterweight and the counterweight drops down and closes the valve. There is always a quantity of sand in the tank which forms a "sand seal" and prevents the muddy water from being discharged into the sand bin.

The screens are furnished with steel water pans which fit between the supporting stringers for the



TYPICAL GRAVEL WASHING PROCESS DESIGNED BY THE RAYMOND W. DULL CO., CHICAGO.

screens and the whole arrangement requires the simplest kind of construction for supports. The spout extension which extends into the following screen has a gable top which prevents the material discharged from the end of the screen from mixing with the material in the spout.

Rinsing water is also introduced in the discharge ends of each screen to wash in the opposite direction from the travel of the gravel and to prevent sand from clinging to the gravel.

The screens have a walkway along them and are arranged for easy accessibility. Any screen can be dismantled without any interference with the others.

NEW GRAVEL PLANT FOR DECATUR.

J. W. McGrath and T. E. McGrath, acting for the Mackinaw Sand and Gravel Co., have taken a long term lease on sixty acres of gravel land within a mile of Decatur, Ill. The property is owned by John Dipper and is considered the best deposit of gravel in Macon county. A washing and screening plant will be installed by the company, which is an organization of local business men. The plant will serve principally the city of Decatur. Large motor trucks and teams will be used to deliver the product to the contractors.

The Mackinaw Sand and Gravel Co. has two plants now in operation with a combined daily capacity of fifty cars, one plant being located at Mackinaw and the other at Chillicothe. Their product at this time is used on state and United States contracts.

SAND AND GRAVEL BRIEFS.

The interests of the Cramer Quarry Co., near Derry, Pa., have been sold to the Columbia Plate Glass Co., of Blairstown, Pa. The capacity of the plant will be increased from 150 to 400 tons of sand per day. Charles C. Hartman of Derry, Pa., is president of the Cramer company, which has been operating for several years and which has a large supply of fine sand rock.

The second largest sand pits in Wisconsin have been opened near Beloit, Wis., by the Chicago, Milwaukee & St. Paul Railroad Co. The daily production during the remainder of the season will be about eighty-five cars.

Improvements have been completed at the gravel pits near Burlington, Wis., owned by Racine county. New bins have been constructed and the side tracks removed from the old bins to the new.

During a single month the Silica Products Co., Lancaster, Pa., has shipped 336 carloads of sand from its plant in the Welsh mountains, once the haunt of the famous Abe Buzzard and his outlaws.

NEW SAND AND GRAVEL INCORPORATIONS.

The Granite Rock & Gravel Co., Fresno, Cal.; incorporators, J. D. Grant, A. R. Kersteller, G. L. Allen, M. L. Tackesberry and others.

Brevoort Silica Co., Chicago, Ill.; capital, \$50,000; incorporators, Charles P. Brevoort, M. B. Perkins, C. H. Partin.

Kansas City Sand Co., Kansas City, Mo., capital \$60,000; incorporators, Chas. Meirhoffer and others.

Streeter & Sons Co., Worcester, Mass., capital \$20,000; to deal in sand, gravel, etc.; incorporators, E. S. Streeter, Clarence R. Streeter and A. L. Streeter.

Ross Hill Silica Co., Inc., Rochester, N. Y., capital \$42,500; incorporators, L. J. Friederich, K. B. Castle and J. F. Warner.

Bull & Wilbur, Inc., Otisville, N. Y., capital \$30,000; sand, gravel, stone, etc.; incorporators: Geo. R. Bull, Bloomingburgh; J. Leslie Wilbur, Otisville, and Frank H. Finn, Middleton, N. Y.

The Delaware Sand & Gravel Co., Muncie, Ind., capital \$25,000; incorporators, J. L. Kimbrough, K. A. Oesterle and Frank H. Kimbrough.

Canal Silica Sand Co., Chicago, Ill., has increased its capital from \$5,000 to \$6,250.

Holmes Sand & Gravel Co., Millersburg, Ohio, capital \$25,000; incorporators, John W. Fenton, W. F. Lohas, S. W. Osborn, Wayne Stillwell and Chas. Lohas.

The Lakeshore Sand Co., Toronto, Ont.; capital, \$50,000.

Lycoming Silica Sand Co., Montoursville, Pa., capital \$18,000; directors, Weldon W. Gulick, Riverside; E. E. Sherman, J. A. Helm, Montoursville; Andrew W. Siegel, Williamsport.

Frontier Sand & Gravel Corporation, North Tonawanda, N. Y., capital \$10,000; sand, grit, gravel, etc.; incorporators, Ralph A. Kellogg, 536 Ellicott square, Buffalo, N. Y.; M. M. Knauth, Buffalo, N. Y.; Francis F. Baker, Buffalo, N. Y.

New London Sand & Stone Co., State and Main streets, New London, Conn., will erect factory at Massapeag (Uneasville, P. O.) Conn.

Berrien Sand & Gravel Co., Benton Harbor, Mich., capital \$12,000.

Knoxville Sand & Transportation Co., Knoxville, Tenn., incorporated by J. A. Kreis, Milton McDermott, J. N. Jones and others.

Eastside Rock & Gravel Co., care of Alfred W. Allen, 633 Union Oil Bldg., Los Angeles, Cal., capital \$10,000.

Evansville Sand & Gravel Co., Evansville, Ind., has increased its capital from \$25,000 to \$50,000.

PROPERLY EQUIPPED YARD PRODUCES RESULTS

Contractors who purchase their materials from L. G. Everist, Inc., Sioux City, Ia., need never worry about the delivery of materials on specified times. In fact, the regularity of this service is responsible at the present time for the large business of this concern.

The bulk of the material sold by the firm goes to various paving contractors and a steady delivery of supplies is kept up day and night throughout the six to eight summer months in which paving work is conducted. For the purpose of supplying the trade the company must always have on hand large quantities of sand, gravel, crushed rock and cement. For this purpose a warehouse with a storage capacity of 11,000 barrels of cement has been installed and facilities for storing upwards of 12,000 yards of aggregate are available in the yard.

The method by which this company handles its sand, gravel and stone is shown in the accompanying illustration of its retail yard at First and Ne-

braska street, Sioux City. It operates two ten-hour shifts and averages twenty cars daily. In rehandling from stock piles a Brown-Hoist crane is used and from 1,000 to 1,100 tons are thus handled daily, all of the material going through overhead hoppers. In delivering to city work seven trucks, six of which are of Pierce-Arrow five-ton dump-body design, are used. At present, ninety per cent of the material handled by the firm consists of sand, gravel and crushed stone, the balance being steam coal. When the demand for aggregates ceases, the same equipment is used for rehandling coal.

Sand is shown in the foreground of the picture with 12,000 yards of crushed rock in the background.

L. G. Everist, Inc., handles a full line of builders' supplies and specialties as well as a complete variety of coal.

NETHERLANDS TRADE IN PORTLAND CEMENT.

The Dutch state and city governments, as well as the railroad companies and other big concerns, seldom purchase cement themselves, but leave the buying to the contractors, subject, however, to their approval, says Consular Agent, A. C. Nelson, Scheveningen. The government has no testing laboratories of its own, such work being done for it by private concerns. The German specification of 1909 is a generally accepted standard of quality for ordinary construction.

Cement is delivered almost exclusively in cloth bags containing 50 kilos (110 pounds) gross weight. The bags are charged to the buyer, subject to full credit upon their return to the cement manufacturer. There is no import duty on cement.

The cement trade of Holland is in the hands of a large syndicate consisting of Dutch, German, Belgian, English, and Norwegian firms, but I learned the other day that a Dutch company is about to be formed with the object of importing American goods in general and Portland cement in particular. The name of the chief promoter of this new concern may be had upon application to the Bureau of Foreign and Domestic Commerce or its district offices. Refer to file No. 73994.

The Lawrence Portland Cement Co., Charles A. Porter, superintendent, at its plant at Northampton, recently set off one of the largest blasts ever exploded in this section of the country. The blast dislodged 150,000 tons of cement rock, 40,000 pounds of powder being used, in twenty-six holes, each 125 feet in depth.



RETAIL YARD OF L.G. EVERIST, INC., SIOUX CITY, IOWA. STORAGE FILES CONTAIN 12,000 YARDS OF SAND, GRAVEL AND CRUSHED STONE. SHED IN BACKGROUND HAS CAPACITY OF 11,000 BARRELS OF PORTLAND CEMENT.

Traffic News

CAR SURPLUSES AND SHORTAGES.

In its statistical statement No. 18, the committee on relations between railroads, American Railway Association, gives a summary of freight car surpluses and shortages for July 1, 1916, with comparisons. On that date there was a surplus of 67,014 and a shortage of 14,898 freight cars. Thirty days previous there was a reported surplus of 70,310 and a shortage of 12,617 cars. On July 1, 1915, there was a surplus of 276,421 and a shortage of but 785 cars.

There has been little change in the total car surplus situation since the report for June 1. There is a considerable box car surplus west and northwest of Chicago and on the Pacific coast, but little in any other section. The coal car surplus shows a slight decrease, the greater part of the surplus being west and northwest of Chicago and in the east. The miscellaneous car surplus is mostly on the Pacific coast and in the middle west.

There is a very small increase in the box car shortage in practically all parts of the country, and a small increase in the coal car shortage in the east, but no large amount of shortage of any class of equipment in any one section. The figures by classes of cars follow:

Classes	Surplus	Shortage
Box	26,435	8,465
Flat	3,189	902
Coal and gondola	14,097	5,003
Miscellaneous	23,273	528
Total	67,014	14,898

HOW TO PREVENT EMBARGOES.

The New Haven railroad has issued and distributed a circular to various shippers and receivers of freight as well as commercial organizations in New England under the caption, "How to Prevent Embargoes," which contains suggestions outlining how congested conditions can be avoided, thus eliminating causes for embargoes.

These suggestions might well be brought to the attention of every shipper and receiver of freight throughout the country. The National Industrial Traffic League committee on car demurrage and storage calls attention of League members to the suggestions in question, some of which have been slightly modified.

1. Ship at an average rate, only as rapidly as unloading is assured.

2. If there is any failure on the part of the railroad representatives to advise you promptly of the receipt and placement of your freight or to co-operate with you, bring this to the attention of the officers of that company; if there is continued failure on the part of any carrier to co-operate with the shipper to relieve congested conditions, please bring it to the attention of the secretary of The National Industrial Traffic League.

3. The capacity of carriers, railroad freight stations and warehouses, especially in the larger centers, is limited and such facilities should not be used for storage purposes. To avoid accumulation in freight houses consignee should arrange for prompt removal of his freight.

4. Load and unload every car promptly, the day it is placed, if possible.

5. Endeavor to get all cars on any certain track loaded or unloaded each day, so that the track may be cleared and resotted as a whole. This is of great importance where tracks are used for switching movements, and main tracks required for important and fast trains.

6. Get in your supply of coal for next winter during the season of favorable weather, commencing immediately, ordering shipments forward moder-

ately and at a regular rate. It was the overbuying of coal in large quantities last fall that started the serious congestion in New England during the past winter, and this reacted on the car supply generally.

7. Improve your existing facilities where possible for unloading, handling and storing freight, requesting the co-operation of the operating and engineering officers of the railway on which you rely for service.

8. Use your influence with all other shippers and consignees in your neighborhood in order that the delinquency of one may not penalize the many.

While it may seem to be impractical for some shippers to follow out the suggestions contained in Article six, we believe material improvement could be brought about by all shippers anticipating the approach of winter and bad weather with the consequent depreciation in transportation services by accumulating a surplus supply of coal so that the balance of their demands might move with reasonable dispatch.

Special attention is invited to the suggestions contained in Article seven. In many instances the facilities of shippers can be greatly improved, thus expediting the loading and unloading of cars. Suggestion eight is worthy of careful consideration.

TRAFFIC MEN TO MEET AT DETROIT.

The summer meeting of the National Industrial Traffic League will be held at the Cadillac hotel, Detroit, Mich., Thursday and Friday, Aug. 10 and 11. The docket for the meeting will be distributed about July 25, giving in detail the subjects to be considered. Many of these subjects will be of considerable importance, and every member is urged to arrange his appointments so as to be able to attend this meeting. Traffic representatives of organizations or individual concerns not members of the League are invited to attend the meeting.

SENATE BILL 6118, IMPORT DUTIES.

Senate Bill No. 6118, introduced by Senator Galinger May 23, 1916, and referred to the Senate Committee on Commerce, provides for the assessment of a discriminating duty of ten per cent ad valorem in addition to duties imposed by law on all goods imported in vessels not built in the United States; or in vessels built in foreign countries prior to July 1, 1916. And a duty of three cents per ton, not to exceed in the aggregate fifteen cents per ton in any one year, at each entry on all vessels built in the United States and wholly owned by citizens thereof; or on vessels built in foreign countries prior to July 1, 1916, and wholly owned by citizens of the United States, from any foreign port or place in North America, Central America, the West India Islands, the Bahama Islands, the Bermuda Islands, or the coast of South America bordering upon the Caribbean Sea, or Newfoundland. And a duty of six cents per ton, not to exceed thirty cents per ton in any one year at each entry on all vessels built in the United States, owned by citizens thereof, and on vessels built in foreign countries prior to July 1, 1916, owned by citizens of the United States; and a duty of thirty cents per ton at each entry of all vessels built in the United States and which at time of entry are under foreign flags, entered at any port of the United States from any foreign port or place. And a duty of fifty cents per ton at each entry of all other vessels which shall be entered in any port of the United States from any foreign port or place, except on vessels in distress or vessels not engaged in trade.

This bill requires the president, within ten days after the passage of this act, to notify all foreign countries with which commercial agreements have been made which are in any way in conflict with

this bill, to give whatever notice is required for the termination of such commercial agreements which may be in conflict with this bill.

H. H. FATE PASSES AWAY.

Harley H. Fate, president of the J. D. Fate Co., of Plymouth, Ohio, manufacturers of the Plymouth gasoline industrial locomotive and a line of clay-working machinery, died in the Huron Road Hospital, Cleveland, O., May 27. Mr. Fate was 42 years old. His death followed a minor operation.

Harley Fate was the son of John D. and Mary E. Fate. He was born in Crestline, O., Feb. 19, 1873. When nine years old his father moved to Plymouth, where the elder Fate founded the Fate industry which was the foundation of the J. D. Fate Co. of today, to the presidency of which Harley H. Fate succeeded upon the death of his father in 1902.

The business of the J. D. Fate Co. is being conducted by Harry S. Fate, who succeeded his brother as head of the temporary organization; George B. Drennan, secretary-treasurer; H. Ray Sykes, director and acting general manager.

A. E. TUCKER DIES AT CHATTANOOGA.

Albert E. Tucker, president of the Chattanooga Paint Co., died at Chattanooga, Tenn., on Friday, June 30. His reputation as president of the company made him well beloved among his associates and employees. He was well liked wherever known and in his death the industry loses a man of high ability, good culture and exemplary character.

OBITUARY.

George D. Hope, wealthy lime yard proprietor, died unexpectedly, July 7, at the St. Regis Hotel, Kansas City, Mo. Heart disease was the cause.

It was when he was eleven years old that Mr. Hope first began to battle for the fortune he acquired later. Then he was employed by his father. During the next seven years he worked while other boys played about his home in Pleasant Hill, Mo.

At the age of eighteen he established himself in business at Belton, Mo. There was the starting of his first lumber yard. Since then he had accumulated much through the lumber business and, at the time of his death, conducted eighteen yards throughout the country in addition to his holdings and general offices in Kansas City.

Edward C. Kirschmann, one of the best known sand and stone dealers in the vicinity of Reading, Pa., died recently at the age of fifty-five years. Death was due to rheumatic trouble which had effected his heart. Mr. Kirschmann's place of business was one of the most widely patronized institutions of its kind in the state of Pennsylvania.

Dan J. Whittemore, aged eighty-six years, a pioneer resident of Milwaukee, Wis., died at his residence on Sunday night, July 16. He had been confined to his home for the past two years because of illness. Mr. Whittemore was the first to determine the real value of the cement rock which lies on the Milwaukee river, a short distance north of the city limits. He conducted experiments with the rock and became engineering head of the Milwaukee Cement Co. Mr. Whittemore was for sixty years connected with the Chicago, Milwaukee & St. Paul Ry. as engineer, chief engineer and finally as consulting engineer. He had charge of constructing many miles of railway and great bridges across the Mississippi and Missouri rivers, and evolved the plan of extending the road to Puget Sound, being in full charge of the construction. He is survived by a widow and one daughter.

JULY 22, 1916.

ROCK PRODUCTS AND BUILDING MATERIALS

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WISCONSIN OUTING A COMPLETE SUCCESS.

(Continued from page 23.)

hour's visit on the bay front and then motored back to Sturgeon Bay, stopping on the way to view an auto race.

The guests began leaving Sunday afternoon, although a number remained until Monday, some repairing to the Lodge and others stopping at hotels in the city of Sturgeon Bay.

"Not a dull moment from the time I arrived until now," was the common remark of every one of the guests as they departed for home.

As the roads were in fairly good condition a large number of the dealers motored to Sturgeon Bay, taking their families with them. Some of the men who came along stopped at towns on the way and picked up fellow dealers, every machine reaching the city crowded to seating capacity and some far exceeded that.

The outing at Cabot's Lodge will long be remembered by every one who made the trip. It is hoped that a similar outing may be arranged for next year in the land where the fragrant spruce and hemlock and the delightful climatic conditions seem to thrill those who come from points where the environment is of a different nature.

Dealers of northeastern Wisconsin are to be complimented on having in their midst such a man as Mr. Isherwood to manage these affairs. He was ably assisted by the Commercial Club of Sturgeon Bay and by Enos Colburn of Green Bay, M. B. Helmer of Fond du Lac, Stephen Balliet of Appleton and W. J. Nuss of Sheboygan.

SERVICE FEATURE SELLS TRUCKS.

"One reason for the recent extraordinary increase in the sale of motor trucks lies in the fact that buyers no longer measure power-haulage possibili-

ties by horse-haulage standards," says H. P. Branstetter, of the KisselKar.

"They used to ask how many motor trucks it would take to do the same work then being done by animals. Now they simply ask how far the truck will go and how much it will carry. They realize that service is the major element in building business. With trucks they have a less restricted zone of operation and therefore a greatly multiplied population from which to trade."

CONCRETE ON THE FARM.

"Concrete on the Farm and in the Shop," is the title of a book by H. Colin Campbell, C. E., E. M., just published, for the beginner in concrete construction and should prove of great value to the farmer, home owner or small shop owner who wishes to do his own concreting and may also be read by contractors and engineers with profit. Mr. Campbell has sought in this work to translate the technical expressions and terms usually associated with concrete work into plain everyday English, so that anyone capable of reading can understand. Simple drawings accompany the text and in many cases photographs illustrate work in progress or completed.

Methods of selecting aggregates, principles of proportion in concrete mixtures and the mixing itself are handled in a very practical manner. A table of concrete mixtures is given for various forms of work and is accompanied by all the necessary information relative to concrete construction, including reinforcements, forms and tools.

Many practical concrete products are illustrated and described, ranging from concrete fence posts and hog feeding troughs to sidewalks and pavements.

The book is for sale by the book department of ROCK PRODUCTS AND BUILDING MATERIALS at seventy-five cents per copy.

FEDERAL FIRST OVER MICHIGAN PIKE.

The first motor truck to take a trip over the East Michigan pike was a Federal. On Monday morning, July 10, a Federal one-and-one-half-ton truck started from Detroit with a large number of pleasure cars over the first annual tour of the East Michigan pike. Only a small portion of this highway between Detroit and Mackinac City is improved, long stretches of the road being over sand trails and corduroy roads. The trip was intended to arouse enthusiasm for good roads and the road when completed will form a link of the Dixie Highway. The trip was taken under the supervision of the Good Roads Committee of the Detroit Board of Commerce, an organization active in the work for good roads. The truck travelled over three hundred miles and carried the baggage for the tourists.

Federal trucks played a conspicuous part in the recent mobilization of the various National Guard units throughout the country. In New York City for instance, the Seventh Regiment was presented with nine Federal trucks, purchased by the veterans of the regiment. The trucks were used to deliver transport army stores and equipment from the Armory to Jersey City. They will follow the Seventh to the border. In St. Louis the spacious garage of the Federal Truck Co. on Forest Park Boulevard was turned into a drill "ground" by the First Regiment when rain forced them to seek shelter.

There are more Federal trucks than any other make now being operated in the Hawaiian Islands. A recent survey revealed the fact that Federals led all others by forty-four cars. The first and only motor truck ever owned in the Bahama Islands is a Federal. It is used on the Island of New Providence to haul pineapples from a plantation to Nassau.

MITCHELL HYDRATED=LIME

helps to make a better concrete job. It makes the mix flow more readily into every corner of the forms. It makes a dense mass that doesn't leave pockets or voids. That's why it's the greatest waterproofing medium known.

Hydrated Lime insures a uniform mixture, because it makes a fat, adhesive mortar that adheres to each piece of the coarse aggregate, reducing segregation to a minimum. Hydrated Lime gives the mixture the plasticity to destroy the excess friction caused by the angular condition of the aggregate, forming a smooth-flowing, continuous stream of concrete that automatically falls into place, saving labor in tamping and spading.

The more dense the concrete, the more permanent and water-tight it will be. Your own knowledge will tell you that the prevention of voids will give your operations these characteristics. Hydrated Lime in concrete greatly reduces contraction and expansion, making the structure less liable to the development of cracks. Write us for complete information about Hydrated Lime.

MITCHELL LIME CO., Mitchell, Ind.

The market place of the building material industry. Employment department, machinery wanted and for sale, etc. If your wants are not answered in this page, write a letter to this office.

THE FRANCIS PUBLISHING CO.
537 S. Dearborn Street Chicago, Illinois

EMPLOYMENT WANTED

Experienced plaster man wants position as superintendent of mixing plant or plaster salesman. Address Box 1140, care ROCK PRODUCTS AND BUILDING MATERIALS.

EMPLOYEES WANTED

WANTED—Salesman with plaster or plaster board experience. Prefer man familiar and well acquainted in Eastern States and similarly employed at present. Liberal salary and splendid opportunity for right man to become Division Manager. Give fullest details about yourself and experience. All replies treated confidentially. S. S. Jenkins, Pres., Samson Plaster Board Company, Buffalo, N. Y.

Salesmen of dominant ability with successful records in building supplies, especially technical paints, water-prooings, and floor hardeners. Only topnotchers need reply. Give complete business history and territory covered. A big corporation wants big men. Address Box 1143, care ROCK PRODUCTS AND BUILDING MATERIALS.

Would like to correspond with an up-to-date Lime and Hydrate man as foreman at our plant. Must have good references and be quite young. Address P. O. Box 192, Helena, Mont.

WANTED—An experienced quarry foreman familiar with deep quarry work and sinking quarries. State age, experience and salary desired. Address Box 1142, care ROCK PRODUCTS AND BUILDING MATERIALS.

MACHINERY WANTED

WANTED—A rotary sand-lime brick press twelve mold Saginaw press preferred. State condition, price and location. Address Box 1120, care ROCK PRODUCTS AND BUILDING MATERIALS.

WANTED TO BUY—One 100-T or larger second hand steam shovel. Must be in first class condition. Address The Western States Portland Cement Co., Independence, Kansas.

PLANTS FOR SALE

LIME MANUFACTURING PLANT

LIME MANUFACTURING PLANT, on trunk line midway between Jacksonville and Tampa, Florida. Best of freight rates. Substantial business already acquired in building, sanitary, fertilizer and paving stone lime. Address John M. Graham, Ocala, Fla.

Marvel Chutes

Stand for Protection Strength & Longevity

—See the large door and wings protecting the siding and foundation from coal damage when open. Automatic lock—burglar proof when closed. Heavy gray iron frames give unlimited strength. Once installed will last a life-time.

We want an agent in each town. Write for leaflet "R" and prices. INTERSTATE MFG. CO., Oskaloosa, Ia.



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of
Quality.

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The Jaite Company
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Bagged, Boxed

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Advertisements will be inserted in this section at the following rates:
For one insertion 25 cents a line
For two insertions 45 cents a line
For three insertions 60 cents a line
Eight words of ordinary length make one line.
Heading counts as two lines.
No display except the headings can be admitted.
Remittances should accompany the order. No extra charges for copy of paper containing the advertisement.

MACHINERY FOR SALE

FOR SALE.

One 5-ft.x22-ft. Bonnot tube mill, steel lining.
One 5-ft.x22-ft. Bonnot tube mill, wood block lining.
One 4-ft.x16-ft. Schmidt tube mill, silax lining.
One Bonnot stone separator.
One 42-in. Sturtevant Underrunner emery mill.
Three 6-in.x5-in. Bonnot slurry pumps.
Two 5-in.x4-in. Bonnot slurry pumps.
One 250 H.P. Hamilton Corliss Engine.
One six ton Byers geared locomotive.
Twenty K & J two-way dump cars, three yard capacity.
One 60-ft.x16-ft.x5-ft. dredge boat, 5-in. side, and ends, bolted.
All in good condition and ready for delivery.
Charles F. O'Donnell, Bellefontaine, Ohio.

THE BEAL CORE DRILL.

Best and cheapest for testing all kinds of rock and mineral lands. Cores taken out from 3 to 5 inches in diameter. Estimates furnished on work by the foot or day. Edw. S. Beal, Contractor, 214 Woodlawn Ave., Lansing, Mich.

FOR SALE—One No. 24 American Ring Pulverizer, manufactured by the American Pulverizer Co., E. St. Louis, Ill. Machine has $\frac{1}{2}$ rings and $\frac{1}{2}$ hammers. The grate bars are $\frac{1}{2}$ mesh. Rings, hammers and grate bars are manganese steel. This machine has not been used enough to show any wear. Weight 7,800 lbs. Price very reasonable. Address Box 1137, care ROCK PRODUCTS AND BUILDING MATERIALS.

FOR SALE—INGERSOLL-RAND AIR COMPRESSOR

One 22 $\frac{1}{4}$ x14 $\frac{1}{4}$ x14" Ingersoll-Rand Class "JC" Air Compressor, No. 8130-H.P. and 8131-L.P. Complete. This machine is for all practical purposes, good as new, having been in actual service less than two years. RACINE STONE COMPANY, Corn Exchange Bldg., Chicago.

FOR SALE—2ND HAND.

1 set of Power & Mining Machinery Co.'s 36x16 stone crushing rolls with housings, pulleys and foundation bolts in good condition. Address DOWNEY HEATING & SUPPLY CO., Milwaukee.

Slightly Used Machinery for Sale. One 7x12 Mundy D. C. S. D. Mine Hoisting Engine. One Nagle Portable Boiler, 40" Dia., 42 Tubes 3"x120". J. B. Blanton Co., Frankfort, Ky.

FOR SALE—20 ton S. G. Davenport saddle tank. 30 to 48" gauge end dump steel quarry cars, mixers, crushers, cranes and bollers. A. V. Konsberg, 226 S. La Salle St., Chicago.

FOR SALE—One link belt silent chain drive, excellent condition, ratio 3 $\frac{1}{2}$ to 1. 75 horse power. Address Box 1141, care ROCK PRODUCTS AND BUILDING MATERIALS.

FOR SALE—New No. 3 Newago Separator, style H. Write promptly. Address F. W. T. Co., care ROCK PRODUCTS AND BUILDING MATERIALS.



Stained with Cabot's Shingle Stains and lined with Cabot's Sheathing Quilt. Robert W. Spencer, Jr., Architect, Chicago.

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Crescent Stales or Shingles, Siding, Clapboards, Trimming Boards, and all other Exterior Woodwork.
Waterproof Cement and Brick Stales for waterproofing and artistically coloring cement and brick buildings.
"Quilt" for lining houses to keep out cold or heat, for sound-deadening in floors and partitions, and for insulating cold storage and refrigerators.
Conserve Wood Preservative for preserving Posts, Planks, Sills and all other exposed timbers. Mortar Colors, Protective Paints and Metals, Waterproofing Compounds, etc.

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Everlastingly at It
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FOR SALE—At a Bargain

One No. 00 Raymond Impact Pulverizer.
One No. 12 Smidith Tube Mill.

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CRUSHERS, LOCOMOTIVES,
CARS, STEAM SHOVELS, ETC.
C. G. A. SCHMIDT, Jr.

639 Land Title Bldg. Philadelphia, Pa.

"RAILS"

All sections of new and relay rails in first-class condition. Splice Bars, Frogs, Switches and Spikes also carried in stock. We purchase abandoned plants and cheerfully quote prices on any material that you may have to dispose of.

M. K. FRANK, Frick Bldg., Pittsburgh, Pa.

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We have many bargains in high-grade "used" Steam Shovels, Locomotives, Cars, Cranes, Cableways, Crushers, Air Compressors, Hoists, etc. What do you need?

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Manufactured by C. K. Williams & Co.
Correspondence Sought
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The Future of Macadam Roads



Boulevard between Pleasantville and Atlantic City, New Jersey. Five miles long, 60 feet wide. Gravel with Glutrin Binder. Five years old.

is an assured success by the use of Glutrin Road Binder. Glutrin Bound Roads maintain a durable, firm surface for every month in the year. Glutrin Bound Roads mean more business for this year and future years to every contractor and producer of macadam road material.

FULL INFORMATION UPON REQUEST.

YOUR CO-OPERATION IS EARNESTLY INVITED.

The Glutrin Paving Co., Hartman Bldg., Columbus, O.

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F. W. Taylor and G. E. Thompson. Price \$5.00. C
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Cement Users

- Portland Cement for Users
Henry Faixa and D. B. Butler. Price \$1.50. C
- Cements, Mortars and Concrete
Myron C. Falk. Price \$2.50. C
- Reinforced Concrete
W. H. Gibson and W. L. Webb. Price \$1.00. C
- Hand Book of Cost, Data
Halbert P. Gillette. Price \$5.00. C
- Concrete Construction
H. P. Gillette and C. S. Hill. Price \$5.00. C
- Cement Workers' and Plasterers' Ready Reference
H. G. Richay. Price \$1.50. C
- Reinforced Concrete
A. W. Buel and C. S. Hill. Price \$5.00. C
- Concrete
Edward Godfrey. Price \$2.50. C
- Reinforced Concrete
C. F. Marsh and Wm. Dunn. Price \$7.00. C
- Practical Treatise on Foundations
W. Pattoo. Price \$5.00. C
- Concrete
Thomas Potter. Price \$3.00. C
- Cement and Concrete
Louis C. Sabin. Price \$5.00. C
- Concrete and Reinforced Concrete Construction
Homer A. Reid. Price \$5.00. C
- Handbook on Reinforced Concrete
F. D. Warren. Price \$2.50. C
- Popular Handbook for Cement and Concrete Users
Myron H. Lewis & A. H. Chandler. Price \$2.50. C
- A Manual of Cement Testing
Richards & North. Price \$1.50. V
- A Treatise on Cement Specifications
Jerome Cochran. Price \$1.00. V
- Manual of Reinforced Concrete and Concrete Block Construction
Chas. F. Marsh and Wm. Dunn. Price \$2.50. V

ROCK PRODUCTS AND BUILDING MATERIALS 537 S. DEARBORN STREET CHICAGO

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

CLASSIFIED BUSINESS DIRECTORY

BAGS AND BAG MACH'Y.

Bates Valve Bag Co.

Jaite Company, The.

BELTING.

H. W. Caldwell & Co.

Dull & Co., R. W.

Goodrich Co., B. F.

Imperial Belting Co.

Link Belt Co.

New York Rubber Co.

Revere Rubber Co.

Webster Mfg. Company.

Weller Mfg. Co.

BRICK.

Metropolitan Paving Brick Co.

BRICK CLAMPS.

The P. D. Crane Co.

BRICK PAVING.

Metropolitan Paving Brick Co.

BUCKETS, DUMPING AND GRAB.

Atlas Car & Mfg. Co.

H. W. Caldwell & Co.

Haiss Mfg. Co., Inc., Geo.

Hendrick Mfg. Co.

Lakewood Engineering Co.

Link Belt Co.

McMyler-Interstate Co.

CABLES.

American Steel & Wire Co.

Dull & Co., R. W.

Leschen & Sons Rope Co.

Sauerman Bros.

CALCINING MACHINERY.

Atlas Car & Mfg. Co.

CARS, INDUSTRIAL.

Atlas Car & Mfg. Co.

Austin Mfg. Co.

Haiss Mfg. Co., Inc., Geo.

Lakewood Engineering Co.

Link Belt Co.

Stephens-Adamson Mfg. Co.

Weller Mfg. Co.

CASTINGS.

Allis-Chalmers Mfg. Co.

Traylor Eng. & Mfg. Co.

CEMENT, CAEN STONE.

Cleveland Bldrs' Supply Co.

CEMENT, HYDRAULIC.

Carolina Portland Cement Co.

Utica Hydraulic Cement Co.

CEMENT, PORTLAND.

Atlas Portland Cement Co.

Carolina Portland Cement Co.

Chicago Portland Cement Co.

Clinchfield Portland Cement Corp.

Coplay Cement Mfg. Co.

Edison Portland Cement Co.

Huron-Wyandotte Port. Cement Co.

Kosmos Portland Cement Co.

Lehigh Portland Cement Co.

Marquette Cement Co.

Northwestern States Portland Cement Co.

Ohio & Western Lime Co.

Sandusky Cement Co.

Standard Portland Cement Co.

Whitehall Portland Cement Mfg. Co.

Wolverine Port. Cement Co.

CHAINS.

Jeffrey Mfg. Co.

Link Belt Co.

CLAYWORKING MACH'Y.

American Clay Machy. Co.

Bartlett, C. O., & Snow Co.

COLORINGS DRY AND MORTAR.

Samuel Cabot.

Calvert Mortar Color Wks.

Chattanooga Paint Co.

Ricketson Mineral Paint Works.

Williams, C. R., & Co.

COMPRESSORS.

Allis-Chalmers Mfg. Co.

Clayton Air Compressor Co.

International Steam Pump Co.

CONCRETE MIXERS.

Lakewood Engineering Co.

Miscampbell, H.

Power & Mining Mach. Co.

CONCRETE REINFORCEMENT.

American Steel & Wire Co.

CONSULTING GEOLOGISTS.

Hunt, Robt. W., & Co.

CORNER BEADS.

North Western Expanded Metal Co.

Sykes Metal Lath & Roofing Co.

CRANES—LOCOMOTIVE AND GANTRY.

Byers Mfg. Co., John F.

Link Belt Co.

McMyler-Interstate Co.

Ohio Locomotive Crane Co.

CONVEYORS AND ELEVATORS.

Allis-Chalmers Manufacturing Co.

Atlas Car & Mfg. Co.

Austin Mfg. Co.

Bartlett, C. O., & Snow Co.

Bartlett, H. W., & Sons Co.

Dull, Raymond W., & Co.

Ehrsam, J. B., & Sons Mfg. Co.

Haiss Mfg. Co., Inc., Geo.

Jeffrey Manufacturing Co.

Link Belt Co.

McMyler-Interstate Co.

McLanahan Stone Machine Co.

Power & Mining Mach. Co.

Stephens-Adamson Mfg. Co.

Toepfer, W., & Sons.

Webster Mfg. Company.

Weller Mfg. Co.

CRUSHERS AND PULVERIZERS.

Allis-Chalmers Manufacturing Co.

American Pulverizer Co.

Austin Mfg. Co.

Bacon, Earl C.

Bartlett, C. O., & Snow Co.

Bradley Pulverizer Co.

Butterworth & Lowe.

Chalmers & Williams.

Ehrsam, J. B., & Sons Mfg. Co.

Good Roads Machy. Co.

Jeffrey Manufacturing Co.

K-B. Pulverizer Co.

Kent Mill Co.

Lehigh Car, Wheel & Axle Co.

Lewisburg Foundry & Machine Co.

McLanahan Stone Machine Co.

Midland Crusher-Pulverizer Co.

Pennsylvania Crusher Co.

Raymond Impact Pulverizer Co.

Stedman's Fdy. & Mach. Wks.

Sturtevant Mill Co.

Traylor Eng. & Mfg. Co.

Webb City & Carterville F. & M. Wks.

Williams Pat. Crusher & Pulverizer Co.

Worthington Pump & Mach. Corp.

DRAIN TILE.

American Clay Co.

Vigo-American Clay Co.

DREDGES

Osgood Co., The.

DRILLS.

Jeffrey Mfg. Co.

Sanderson-Cyclone Drill Co.

DRYERS.

American Process Co.

Bartlett, C. O., & Snow Co.

Link Belt Co.

Ruggles-Coles Eng. Co.

ENGINEERS.

American Process Co.

Bacon, Earl C.

Dull, Raymond W., & Co.

Fuller Engineering Co.

Harsh, Earl C.

Hunt, Robt. W., & Co.

Improved Equipment Co.

Sauerman Bros.

Schaffer Eng. & Equip. Co.

Smith & Co., F. L.

Stephens-Adamson Mfg. Co.

Traylor Eng. & Mfg. Co.

ENGINES.

Allis-Chalmers Mfg. Co.

Power & Mining Mach. Co.

EXCAVATORS.

Cable Excavator Co.

Raymond W. Dull Co.

Haiss Mfg. Co., Inc., Geo.

Indianapolis Cable Excavator Co.

Link Belt Co.

McMyler-Interstate Co.

Osgood Co., The.

Sauerman Bros.

Weller Mfg. Co.

FIRE BRICK.

Carolina Portland Cement Co.

Improved Equipment Co.

FURNACES FOR SPECIAL PURPOSES.

Improved Equipment Co.

GAS PRODUCERS.

Improved Equipment Co.

GATES.

Haiss Mfg. Co., Inc., Geo.

GEARS.

Caldwell, H. W., & Son Co.

Jeffrey Mfg. Co.

Link Belt Co.

Stephens-Adamson Mfg. Co.

Weller Mfg. Co.

GLASS SAND MACHINERY.

Lewiston Fdy. & Mach. Co.

GRANITE SCREENINGS.

GRANITE SCREENINGS.

Wisconsin Granite Co.

GYPSUM BLOCK.

U. S. Gypsum Co.

Plymouth Gypsum Co.

GYPSUM—PLASTER.

Best Bros. Keene's Cement Co.

Cardiff Gypsum Co.

Carolina Portland Cement Co.

National Mortar & Supply Co.

Ohio & Western Lime Co.

Plymouth Gypsum Co.

U. S. Gypsum Co.

Wheeling Wall Plaster Co.

HAIR.

Ohio & Western Lime Co.

HOISTS, ELECTRIC AND STEAM.

Allis-Chalmers Mfg. Co.

Link Belt Co.

Haiss Mfg. Co., Inc., Geo.

HOLLOW CLAY TILE.

American Clay Co.

Metropolitan Paving Brick Co.

Vigo-American Clay Co.

HYDRATING MACHY.

Atlas Car & Mfg. Co.

Kritzer Co., The.

Miscampbell, H.

Stacy-Schmidt Mfg. Co.

Toepfer, W., & Sons Co.

LIME.

Carolina P. C. Co.

Kelley Island Lime & Trans. Co.

Mitchell Lime Co.

National Lime & Stone Co.

National Mortar & Supply Co.

Ohio & Western Lime Co., The.

Scioto Lime & Stone Co.

LIME, HYDRATED.

Kelley Island Lime & Transport Co.

Mitchell Lime Co.

National Lime & Stone Co.

National Mortar & Supply Co.

Ohio & Western Lime Co., The.

Scioto Lime & Stone Co.

LIME KILNS.

Atlas Car & Mfg. Co.

Improved Equipment Co.

Stacy-Schmidt Mfg. Co.

LOADERS AND UNLOADERS.

Amburser Company.

Haiss Mfg. Co., Inc., Geo.

Jeffrey Mfg. Co.

Link Belt Co.

Stephens-Adamson Mfg. Co.

Weller Mfg. Co.

LOCOMOTIVES.

Fate Co., J. D.

Jeffrey Mfg. Co.

MANGANESE STEEL.

Allis-Chalmers Mfg. Co.

Link Belt Co.

METAL LATH.

Carolina Portland Cement Co.

North Western Expanded Metal Co.

Sykes Metal Lath & Roofing Co.

Trussed Concrete Steel Co.

MOTOR TRUCKS.

Federal Motor Truck Co.

Garford Motor Truck Co.

Pierce Arrow Motor Car Co.

White Company, The.

PAINT AND COATINGS.

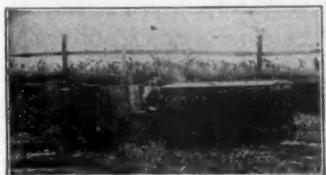
WHITEHALL

PORTLAND CEMENT

Whitehall Cement
Manufacturing Co.
1722 Land Title Bldg.
Philadelphia

"Plymouth Gasoline Locomotive Is So Simple to Run," Says Fleigle, "My 8-Year-Old Son Handles It" ➤

Frank Fleigle, brickmaker of Morrisonville, Ill., knows the Plymouth Gasoline Locomotive is "fool-proof," for Fleigle has proved it by letting his 8-year-old son run one he installed more than a year ago. Fleigle's son not only starts and stops it, but negotiates a 10% grade and handles the "Plymouth" with ease.



*From an Actual
Photograph*

"I Don't Need a Licensed Engineer with the Plymouth," Says Fleigle

"The elimination of gears and clutches makes the 'Plymouth' not only fool-proof, but solves my haulage problem, for your friction-drive locomotive is cheaper to run than feeding two horses, and think what I can do with it!"

Plymouth Gasoline Locomotives Are Cheapest to Buy—Cheapest to Operate

The first cost of the Plymouth is less than any other industrial locomotive and it will do more work, last longer and perform its duty cheaper than any gasoline, electric steam or compressed air locomotive on the market.



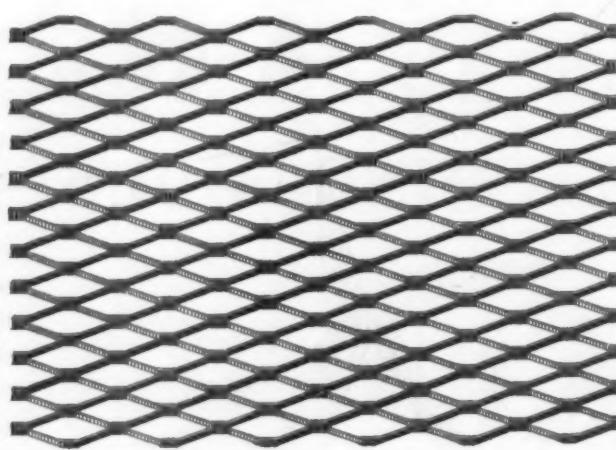
THE J. D. FATE COMPANY
210 Riggs Avenue, PLYMOUTH, OHIO

ROCK PRODUCTS and BUILDING MATERIALS

Index to Advertisements

JULY 22, 1916

Tell 'em you saw it in **ROCK PRODUCTS AND BUILDING MATERIALS**



SYKES Diamond Mesh LATH

Sheets—24 inches by 96 inches.
Nine sheets to the bundle.
Sixteen square yards to the bundle.
Manufactured in painted or
galvanized.

Weight in painted materials as
follows:—

- No. 27 gauge . . . 2.3 lbs.
- No. 26 gauge . . . 2.5 lbs.
- No. 25 gauge . . . 3 lbs.
- No. 24 gauge . . . 3.4 lbs.

Galvanized weights are a trifle heavier.
Prompt shipment from stock at all times.

Sykes Metal Lath & Roofing Company

508 River Road, Warren, Ohio
Also manufacturers of Sykes Expanded Metal Cup Lath
—Self-Furring—and Sykes Trough Sheet Lath.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



Trade Mark

Reg. U. S. Pat. Off.

Dealer Policy

First—to provide a complete line of fireproof building materials and waterproofings. Second—to protect the dealer in the sale of GF Products. Third—to help him sell in every way we can.

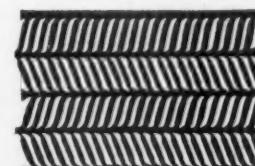
As a result, leading dealers are yearly increasing their business and profit on the GF Line. Where territory is still open we will be glad to send details of the profitable GF Dealership. Better write now.



Self-Sentering
for roofs, floors, curtain
walls, partitions in
every class of building.
Acts as form and rein-
forcement or as lath
and stud. Saves time,
labor and material.



**GF
Steel
Tile**
Steel forms
for T-beams,
concrete floors,
adaptable to
any type of
building, good
for spans up
to 30 feet. Give light weight, economical floors.



Herringbone Lath
The stiffest metal lath
made. Will insure permanence
and satisfaction on all
classes of plaster work—partic-
ularly good for stucco jobs.
Permits 16" to 20" stud spac-
ing without sagging.

Also

Trussit and Expanded Metal Reinforcements,
GF Cold Rolled Channels, Corner Beads, Wall
Ties, etc., and a complete line of GF Water-
proofings, Damproofings and Technical Paints

Write for Dealer Information

The General Fireproofing Co.
1722 Logan Avenue
Youngstown, Ohio

Northwestern Portland Cement



The Reliable Portland Cement

A Portland Cement for the

NORTHWEST

NORTHWESTERN STATES PORTLAND CEMENT COMPANY
MASON CITY, IOWA

Concrete for Permanence "Wolverine" for Concrete

Wherever used "Wolverine" has always given the highest satisfaction

WOLVERINE PORTLAND CEMENT CO.

COLDWATER, MICH.

Write for prices and information. W. E. COBEAN, Gen. Sales Agt.

CAROLINA PORTLAND CEMENT COMPANY

We are the largest distributors of Portland Cement, Lime Plaster, Fire-brick and General Building Material in the Southern States, and have stocks of Standard Brands at all of the Atlantic and Gulf Seaports, and at our interior mills and warehouses, for prompt and economical distribution to all Southern territory. Write for our delivered prices anywhere.

Also Southern agents for the "Dehydratins" waterproofing material. "Universal," "Acme," and "Electrod" Brands Ready Roofing.

GET OUR PRICES

CHARLESTON, S. C.

BIRMINGHAM, ALA.

ATLANTA, GA.

NEW ORLEANS, LA.

Red, Brown, Buff and Black



MORTAR
COLORS

The Strongest and
Most Economical
on the Market.



Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

CHATTANOOGA PAINT CO.

Chattanooga, Tennessee

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

When you consider the number of big

Portland Cement

jobs where the cement used was

Marquette
Portland Cement

you appreciate the popularity of Marquette Service

Look for the bag



with the zig-zag tag

Marquette Cement Manufacturing Co.
Chicago, Illinois

WHEN YOU ABSOLUTELY KNOW THAT

Ricketson's Mortar Colors

are pure and brilliant in tone, economical in application and a permanent guarantee against fading and washing

Why not INSIST on having them?

They are the acknowledged best for all uses—Mortar, Brick, Cement, Concrete and stone. Red, Brown, Buff, Purple and Black.



RICKETSON MINERAL PAINT WORKS, MILWAUKEE, WIS.

PLYMOUTH GYPSUM CO.

FORT DODGE, IOWA

Manufacture what is known as QUALITY BRANDS
ORDER A CAR AND BE CONVINCED

Plymouth Plaster and Finishes White Sand Float Finish

Plymouth Wood Fibre Plaster Best Bros. Keene's Cement

Acolite Cement Plaster Sackett Plaster Board

(the long keeper) Tiger Brand Hydrated Lime

Exterior Plaster

Fireproof Gypsum Partition Tile

Write for advertising matter and prices

BRANCH OFFICES: 1015 Lumber Exchange, Minneapolis
5040 St. Lawrence Ave., Chicago

BANNER HYDRATE LIME

*Carries more sand for Mason Work,
than any other lime on the market*

FOR INFORMATION APPLY TO THE

NATIONAL MORTAR & SUPPLY COMPANY
A. H. Lauman, President

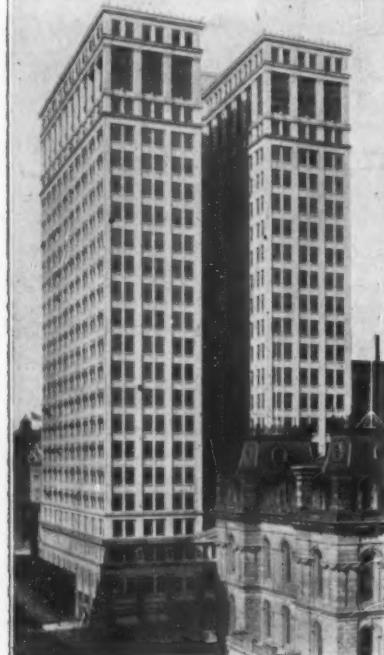
PITTSBURGH, PA.



**IF IT IS
LIME
WE MAKE IT**
(STRONGEST IN OHIO)

BULK and Barreled -:- "MASON'S HYDRATE"—For Brick-work, plastering and masonry. -:- "LIME FLOUR"—Hydrated Finishing Lime—Best on the Market. -:- "CLOVER GROWER"—Land restorer, for the farmer—none better. -:- "CARBO HYDRATE"—Soil sweetener—crop producer. -:- Prompt shipments. -:- A dealer wanted in every town. -:- **WRITE OR PHONE FOR PRICES.**

The Scioto Lime and Stone Co.
Delaware, Ohio



DIME SAVINGS BANK,
DETROIT, MICH.
McNulty Brothers,
Plastering Contractors.

A Million Dollars

Is not spent
carelessly. That
is why all the
walls of this
finest of Michigan
buildings
are finished with

"Lion Brand
Rock
Wall Finish"
Hydrated Lime.

Wrte us

**Ohio and
Western
Lime Co.**
Huntington, Indiana

*The Largest
Producers
of Ohio and
Indiana
Lime*



A Northwestern Ohio Finishing Hydrate

If you are unacquainted with this
product one trial will convince
you of its many good qualities,
among which are its fineness (air
separated), its whiteness and
purity.

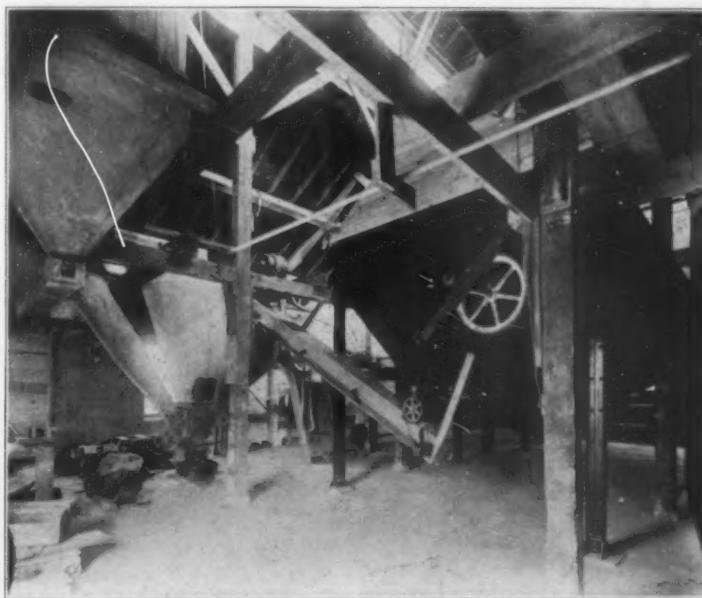
Monarch Hydrate
is guaranteed

Write us for prices and information

The National Lime & Stone Co.
CAREY, OHIO

Perfection

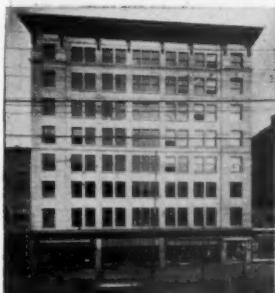
in product and manufacturing processes our aim; special equipment has been designed and built to carry out this idea.



Storage and Blending Bin, capacity 100 tons. Pulverizer, Air Separator and Sacking Bin, capacity 30 tons per day. Installed at Port Clinton, Ohio, plant.

The National Retarder Company 930 North Halsted St. Chicago, Illinois

Mills at Port Clinton, Ohio, Webster City, Iowa



Canadian Dealers Sell Ohio Lime

Canada is a great lime producing country, but dealers over there sell tons of

Tiger Brand White Rock Finish Hydrated Lime

There can be but one reason for this.

Tiger Brand sells more quickly, gives better satisfaction to customers and better profit to the dealer.

If Canadian dealers can make money on it, you surely can.

THE KELLEY ISLAND LIME & TRANSPORT CO.
CLEVELAND, OHIO

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



"Just as I told you—the right cement floor finisher would make our concrete floors wearproof, waterproof and oilproof. Now you see why I specified

R.I.W. CEMENT FILLER & CEMENT FLOOR PAINT

R. I. W. Cement Filler and Cement Floor Paint seal the sandy, porous surface of concrete and cement floors and in this way stop the constant sanding, water infiltration and the soaking up of oil.

And it is so easy to apply—anybody can do it perfectly.

Twelve standard decorative colors. A two-coat proposition that resists wear longer than anything else we have ever seen.

Don't let "cement dust" fly as the floor scuffs off or sands. Stop it immediately with an application of these wonderful preservatives, and save your machinery and stock. Write for Illustrated Booklet from Dept., 12.

TOCH BROTHERS

Established 1848
Inventors and Manufacturers of R. I. W. Preservative Paints, Compounds, Enamels, Etc.

320 5th Ave., New York

Works: New York, London, England and Toronto, Ont., Canada.

These ads are selling goods!

Why Not Stock Them?

Get the Toch Agency Toch Agents are making money because we are always hammering away with ads like the above in forty big national magazines and trade papers. If you're a well established dealer and a "live wire," get in touch with us now, addressing Dept. 12.

This is the
Baby Bates
Valve
Bag Filling
Machine

an adaptation of the single feed principle to a Two Tube Packer for Pulverized Lime-stone and similar Rock Products.

You can pack Lime-stone with this machine for Ten Cents a ton.

LET US
HEAR FROM YOU

Bates Valve Bag Company
1834 McCormick Building



THE BEST BLAST-HOLE DRILL ON EARTH

THE CYCLONE NO. 14

Not a Boast—A FACT

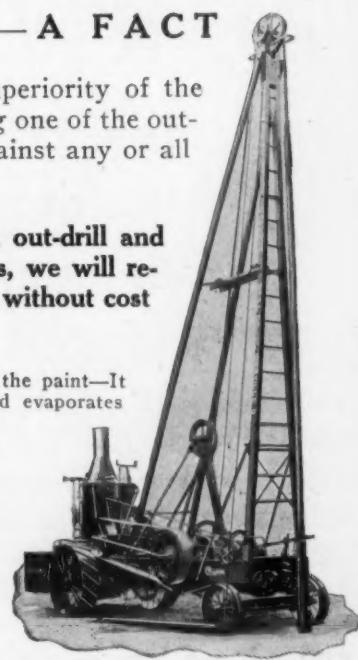
We will prove the superiority of the No. 14 Drill by placing one of the outfitts in your quarry against any or all other makes.

If the Cyclone doesn't out-drill and out-wear all other drills, we will remove it from the work without cost to you.

Our proposition gets below the paint—It eliminates talking points and evaporates hot air. It puts buying on a strictly engineering basis where it belongs.

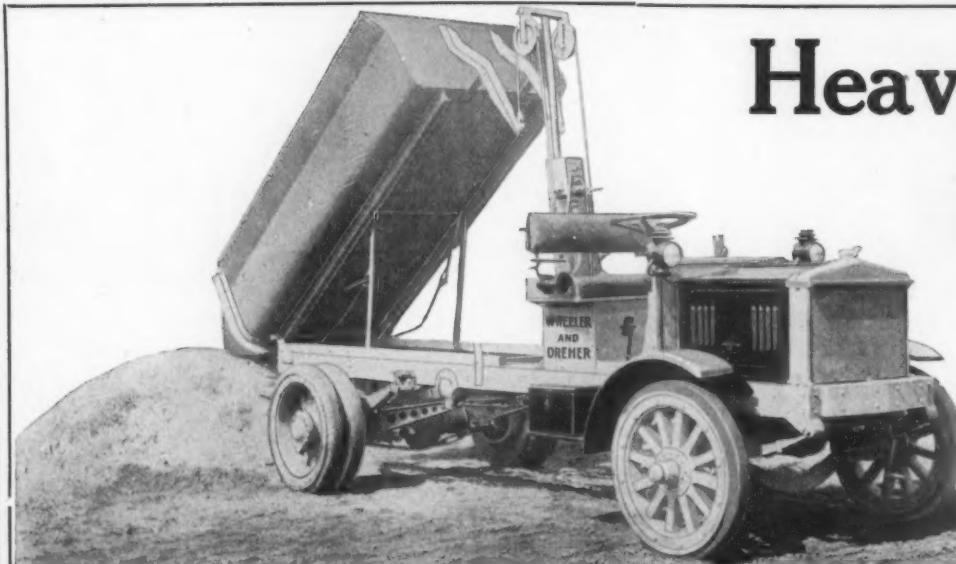
Furnished in Steam, Gasoline, Compressed Air or Electric Power Traction or Non-Traction.

Let Us Send You Full
Particulars



The SANDERSON-CYCLONE DRILL CO.
ORRVILLE, OHIO

Eastern and Export Office, 50 Church St., NEW YORK, N. Y.



Heavy Haulage
Large Tonnage
Hauled Rapidly
 with the

FEDERAL

Our Department of Traffic Investigations has collected daily service reports of Federal Motor Trucks in most every line of business.

Here are some average reports (not exceptional records) of Federal Tonnage and mileage—

Federal Truck No. 10031 made 142 deliveries aggregating 124 tons of material in 17 days.

Federal Truck No. 5079 made 180 deliveries of 236,500 pounds in 12 days.

Federal Truck No. 5172 hauled 664 tons over a distance of 750 miles.

The Federal is "right there" when it comes to tonnage and mileage. It is built for the road and DOES stand up on the road.

Write us for our reports of Federals in the building material business.

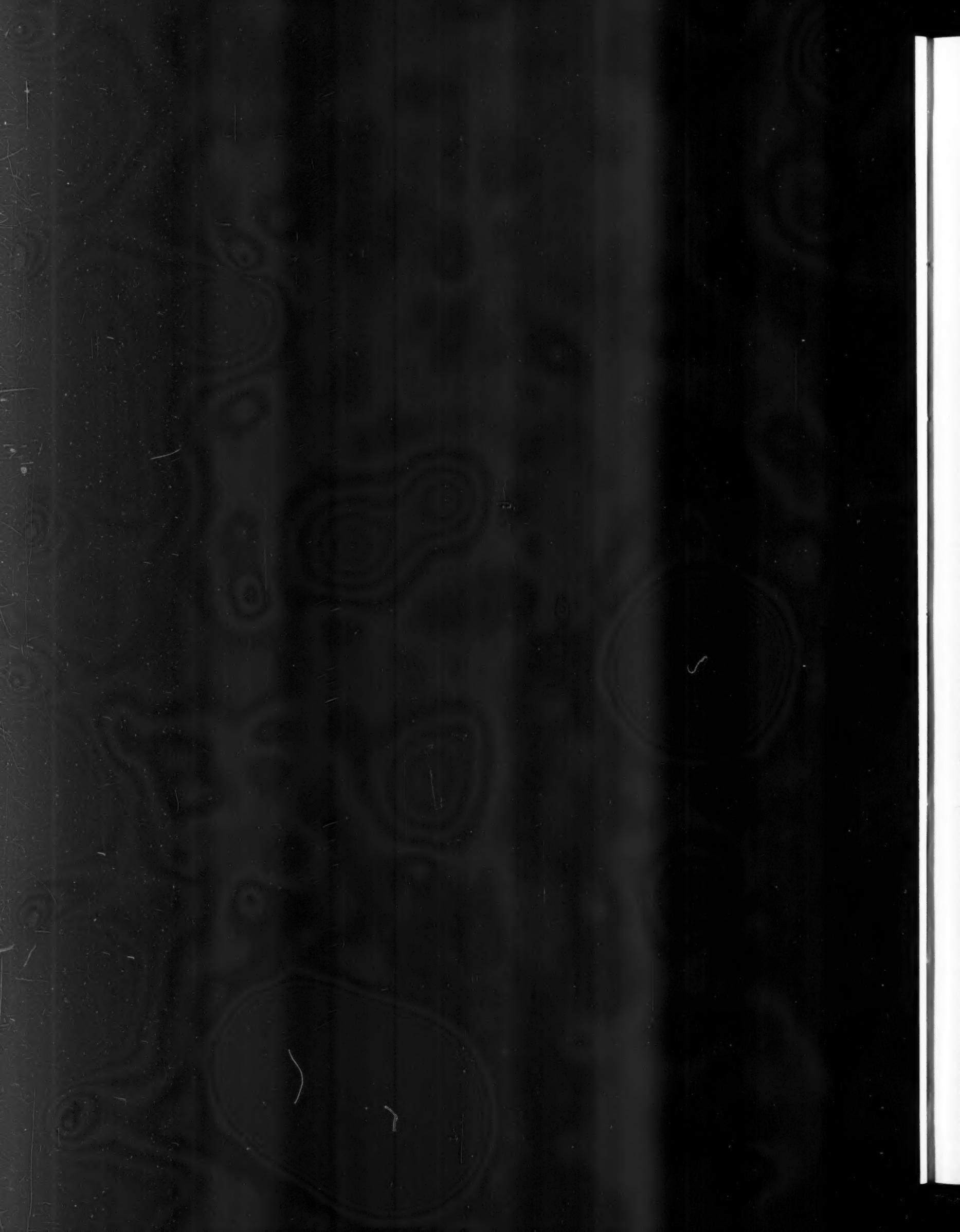
Our magazine on transportation, "Traffic News," will be mailed you free upon request.

Federal Motor Truck Company

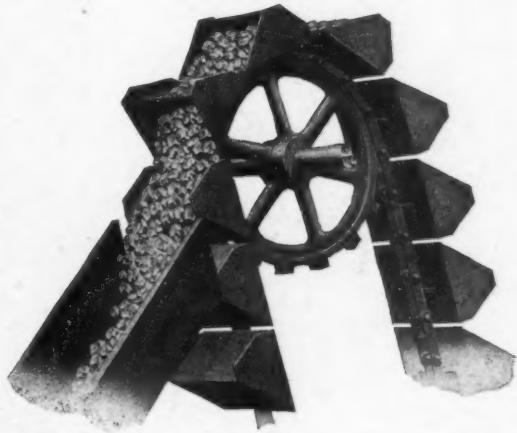
Detroit, Michigan

1 1/2, 2, and 3 1/2 Ton Worm Drive Motor Trucks

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

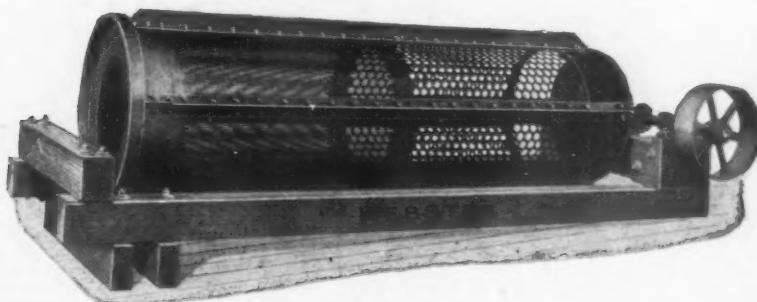


FOR THE LIME PLANT



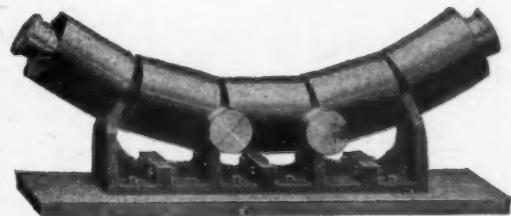
WEBSTER BUCKET ELEVATORS

SINGLE OR DOUBLE STRAND OF CHAIN, OR BELT, WITH CONTINUOUS OR CENTRIFUGAL DISCHARGE BUCKETS FOR VERTICAL OR INCLINED LIFTS.



SCREENS

CYLINDRICAL OR CYL-CONE TYPES, WITH OR WITHOUT JACKETS, FOR STONE, SAND OR GRAVEL.

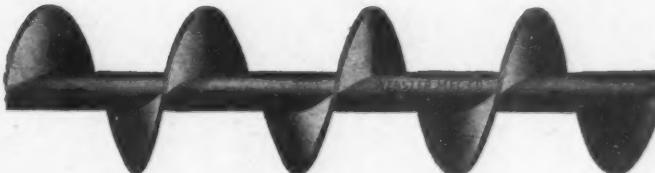


BELT CONVEYORS

PROPERLY DESIGNED IDLERS AND TRIPERS FOR ALL BELT CONVEYOR SERVICES.

SCREW CONVEYORS

MADE OF HEAVY STEEL FLIGHTS ACCURATELY FITTED to PIPES, FURNISHED with or without STEEL BOXES.



THE WEBSTER M'F'G COMPANY
TIFFIN, OHIO

CHICAGO

NEW YORK

(185)



Lime Hydrators, Kilns, Calcining and Quarry Cars



No. 274
End Dump Quarry Car.

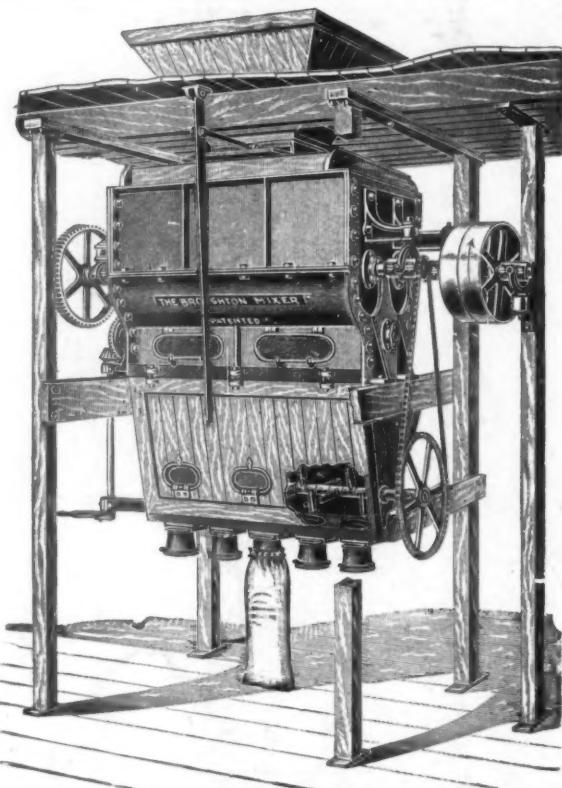


No. 217-H Rocker Side Dump Car
Also made in end dump. Above
car made for loading with
steam shovel.

Reduce Your Handling Costs BY USING ATLAS CARS AND LOCOMOTIVES

Where a trolley wire or third rail is undesirable investigate our storage battery locomotives. Made in several styles and sizes. Cars to suit every requirement.

THE ATLAS CAR & MFG. CO.
909 Marquette Road
Department 6
Cleveland, Ohio



The most thorough and efficient
Mixers of Plaster, Cement and
Dry Materials. Send for Circular.

W. D. DUNNING, Water St., Syracuse, N. Y.

CONCRETE FOR PERFORMANCE

A Good Way to Get More Business

Here's a way to get more business in cement, stone, sand, lumber and other things—and, at the same time, a new source of income.

Here's the plan: Buy a concrete mixer and rent it by the day to contractors and others who do their own concrete work. There will be a big demand for it, for it will do better work than hand-mixing. It will help you develop new jobs. It will advertise you and bring you more business. It will soon pay for itself and then the rent you get for it will be all profit.

Atlas Co-operation

We do not sell mixers, but we shall be glad to give you complete information on this and other good business-getting suggestions. We will also send you on request the *Atlas Almanac*—a monthly magazine rich in valuable business helps.

The Atlas Portland Cement Company

Members of the Portland Cement Association

30 Broad St., New York. Corn Exchange Bk. Bldg., Chicago

Boston
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ATLAS CEMENT

The Standard by which all



PORTLAND
CEMENT
other makes are measured

The *Atlas Portland Cement Company*, 30 Broad Street, New York, or Corn Exchange Bank Building, Chicago:

Send me business-getting suggestions and your monthly *Atlas Almanac*. Name..... Address.....

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